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ANNUAL REPORT
OF THE
SURGEON GENERAL OF THE
PUBLIC HEALTH SERVICE
OF THE UNITED STATES

FOR THE FISCAL YEAR
1920



WASHINGTON
GOVERNMENT PRINTING OFFICE
1920

TREASURY DEPARTMENT,

Document No. 2884.

Public Health Service.

LETTER OF TRANSMITTAL.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, December 1, 1920.

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1920.

Respectfully,

D. F. HOUSTON,
Secretary.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.



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OPERATIONS OF THE UNITED STATES
PUBLIC HEALTH SERVICE

1920



ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE.

TREASURY DEPARTMENT,
BUREAU OF THE PUBLIC HEALTH SERVICE,
Washington, D. C., November 1, 1920.

SIR: In accordance with the act of July 1, 1902, I have the honor to submit for transmission to Congress the following report of the operations of the Public Health Service for the fiscal year ended June 30, 1920. This is the forty-ninth annual report of the service, covering the one hundred and twenty-second year of its existence.

The administrative organization of the bureau on June 30, 1920, was as follows:

- (1) Scientific Research.
- (2) Domestic (Interstate) Quarantine.
- (3) Foreign and Insular (Maritime) Quarantine and Immigration.
- (4) Sanitary Reports and Statistics.
- (5) Marine Hospitals and Relief.
- (6) Personnel and Accounts.
- (7) Venereal Diseases.
- (8) Inspection section.
- (9) Section of Public Health Education.
- (10) Purveying Depot.
- (11) Chief clerk.

The administrative heads of the service and the chiefs of the bureau divisions at the close of the fiscal year consisted of the following:

Surg. Gen. Hugh S. Cumming.

Assist. Surg. Gen. J. C. Perry, in charge of the Division of Personnel and Accounts.

Assist. Surg. Gen. C. C. Pierce, in charge of Division of Venereal Diseases.

Assist. Surg. Gen. W. G. Stimpson, in charge of Division of Marine Hospitals and Relief.

Assist. Surg. Gen. J. W. Schereschewsky, in charge of Division of Scientific Research.

Assist. Surg. Gen. A. J. McLaughlin, in charge of Division of Domestic Quarantine.

Assist. Surg. Gen. R. H. Creel, in charge of Division of Foreign and Insular Quarantine and Immigration.

Assist. Surg. Gen. B. S. Warren, in charge of Division of Sanitary Reports and Statistics.

Assist. Surg. Gen. J. H. White, in charge of inspection section.

Surg. Carroll Fox, in charge of Purveying Depot.

Surg. (R.) Charles Bolduan, in charge of Section of Public Health Education.

Chief clerk, Daniel Masterson.

Secretary to Surgeon General, F. Gwynn Gardiner.

NEW LEGISLATION.

Increased pay.—During the fiscal year ended June 30, 1920, Congress took under consideration the matter of increasing the pay of officers of the Army and Navy, Marine Corps, Coast Guard, Coast and Geodetic Survey, and the Public Health Service. The small salaries received by members of these services had been the cause of considerable dissatisfaction, resulting in a large number of resignations to the detriment of the public interest. After elaborate hearings and considerable discussion by Congress, public act No. 210 was passed, and the President approved this legislation under date of May 18, 1920. This act increased the pay of commissioned and enlisted personnel of the above-mentioned services, and directed that the pay scale therein provided should remain effective until the close of the fiscal year ending June 30, 1922, before which time a special committee created by section 13 thereof should make a report to Congress relative to a permanent adjustment of the pay and allowances of the commissioned and enlisted personnel of these several services.

The increase in pay carried by this act has done much to ameliorate conditions in these services, and, it is believed, has actually been a step in the direction of economy.

Hospital facilities.—With a view to increasing the hospital facilities of the Public Health Service for the care of its beneficiaries, Congress provided, in an act approved by the President on June 5, 1920, that the hospital in the District of Columbia known as the Mount Alto Hospital, and formerly occupied by the National School of Domestic Arts and Sciences, be acquired by the Public Health Service. The acquisition of this institution, which had previously been leased by the Public Health Service from the owners thereof, followed one of the recommendations of the Public Health Service contained in House Document No. 481, submitted to Congress under date of December 5, 1919, in which a total appropriation of \$85,000,000 covering a period of three years was recommended to be spent on increased facilities throughout the country.

The need for additional hospital facilities in the United States at the present time is more urgent than when the matter was brought to the attention of Congress in December of last year. It is therefore urgently recommended that upon the convening of Congress immediate steps be taken to secure the appropriation of funds for carrying into effect, at least partially, the hospital program presented in the above-mentioned House Document No. 481.

SERVICE REGULATIONS.

With the expansion of the Public Health Service during the past two years the regulations for the government of the service, approved in 1913, were found to be inadequate. Accordingly, during the year a board was convened for the purpose of revising the regulations of 1913 and recommending to the Surgeon General such changes

as was deemed necessary to adequately provide for the government of the various activities of the Public Health Service, both in the field and in Washington, under these changed conditions. The recommendations of this board were ultimately approved by the Surgeon General and the Secretary of the Treasury, and new regulations were promulgated by the President under date of August 29, 1920.

CHANGES IN ADMINISTRATIVE ORGANIZATION.

Marine Hospital Division.—The tremendous expansion in the activities of this division because of the increased number of beneficiaries to be hospitalized, pursuant to war-risk insurance legislation, necessarily caused a substantial increase in the administrative force in Washington. To efficiently discharge the administrative duties incident to carrying on this hospitalization, by decentralizing the work and responsibility in this division, it was necessary to establish sections and to group and allot the work to be performed by this division into these various sections.

At the present time the Marine Hospital Division, under the direct supervision of an assistant surgeon general, is composed of the following administrative officers and sections:

- (1) Assistant Surgeon General in charge.
- (2) Executive officer, assistant to the chief of division.
- (3) Personnel section.
- (4) Tuberculosis section.
- (5) Neuro-psychiatric section.
- (6) Construction section.
- (7) Law and finance section.
- (8) Laboratory section.
- (9) X-ray section.
- (10) Dental section.
- (11) Statistical section.
- (12) Reconstruction section.
- (13) Dietetic section.
- (14) Nursing section.
- (15) District supervisors, and
- (16) Executive clerk.

General inspection service.—The opening of many new hospital stations of the Public Health Service, with a consequent increase in personnel and number of patients given treatment, made necessary the provision of some administrative means for inspecting these facilities from time to time to insure their efficient operation. Complaints of mismanagement and mistreatment of patients, very naturally received in larger numbers with extension of the hospital machinery, also required the attention of trained inspectors. Previously it has been the practice of the service to detail one of its officers at some near-by point to investigate and make report to the bureau of complaints of this character. With the increasing number of these complaints, however, it was deemed advisable to create a service composing a corps of trained Public Health Service and ex-Army inspectors who could devote their entire time to investigating matters of this kind and report directly to the Surgeon General. The creation of such a service, aside from the necessity demanding it, has the advantage of insuring prompt and unbiased reports on conditions, due

to the independence of this service of any other division of the bureau. Therefore, on February 16, 1920, upon the recommendation of the Surgeon General, the inspection section of the Public Health Service was created by the Secretary of the Treasury with a commissioned officer, holding the rank of Assistant Surgeon General, in direct charge. In pursuance of the authority contained in the service regulations approved August 29, 1920, the inspection section became the General Inspection Service.

Purveying Service.—For administrative reasons in the past, the Purveying Depot was attached to the Division of Marine Hospitals and Relief. With the increase in its activities consequent upon the general expansion of service activities and because of the fact that it purchases and ships supplies for all stations of the service, it was recommended to the Secretary of the Treasury on April 9, 1920, that this depot be constituted an independent agency of the Public Health Service disassociated from any one division and reporting directly to the Surgeon General, as in the case of the inspection service. Under the service regulations, approved by the President on August 29, 1920, the name of the depot was changed to Purveying Section. The Purveying Service is in fact a purchase and issue division, and the action of the Secretary of the Treasury in approving this administrative charge, it is believed, is a step of importance and in the interest of the efficient management of the supply problem of the service. Viewing the problem in the future, it is believed that before the end of the next fiscal year the volume of business transacted by the Purveying Service, consisting of the purchase and shipment of supplies to stations throughout the United States, will require the decentralization of some of its duties by establishing storehouses in other sections of the country. It is contemplating establishing a storehouse in the central portion of the United States and one each on the Atlantic and Pacific coasts. The establishment of these subdepots will do much to hasten the distribution of supplies to the service activities throughout the country and materially reduce the amount of freight charges necessary in shipping all of the service materials from one storehouse as at present.

SCIENTIFIC RESEARCH DIVISION.

The war has emphasized the importance of public-health work. England, Canada, and Australia have within the last few months established ministries of health, thus recognizing that the care of the public health is one of the most important functions of a government. In the United States the figures resulting from the draft showed that one-third of all of the men presenting themselves for examination were not physically fit to fight, due to defects a large proportion of which were preventable. The importance of this fact can not be overestimated. The protection of the health of the public, including the encouragement of adequate health organizations in all States and localities, must be given serious consideration. True economy demands that additional appropriations be made to the Public Health Service for investigations and demonstrations and other activities bearing upon the protection of the public health. Money spent in this direction will be returned many times in the improved physical condition of the Nation. While the insanitary, disease-spreading privy continues to be typical of our rural conditions, while 7,000,000 people suffer annually from malaria, while one-third of our men of military age are unfit for military duty, and while a disease such as influenza can sweep across the country and kill 500,000 persons in the course of a few months, it is evident that there is a crying need that more attention be paid by the Federal Government to the problems of public health. Where measures for meeting these problems are now known, encouragement should be given to State and local health authorities in carrying them out, and the public should be reached by health educational measures on the part of the Federal Government. Where such measures are not known, opportunity should be had for continuing on a much larger scale investigations which the service already has in progress.

Such investigations have been carried out during the past year through the Scientific Research Division. They have included investigations of diseases of man, industrial hygiene, stream pollution, sewage disposal, child hygiene, public health organization, and other sanitary problems. These have been conducted under the direction of field headquarters and at the Hygienic Laboratory and the Leprosy Investigation Station. In addition to the investigative work, the division has supervised the conduct of demonstrations in rural sanitation, carried on for the special purpose of securing the establishment of permanent, adequate county health organizations, has supervised the enforcement of the law of July 1, 1902, regulating the sale of viruses, serums, toxins, and analogous products in interstate traffic; has conducted hospitals for the purpose of suppressing trachoma; has detailed physicians to various depots of the War Department for the purpose of furnishing relief to civilian employees in cooperation with the United States Employees' Compensation Commission; and has arranged for the representation of the service at

meetings of scientific and sanitary associations and congresses and for popular lectures by service officers before public meetings varying widely in character.

One of the most important features of the work of the division and one which was developed almost entirely in the past year was an investigation in the field of child hygiene. This work was undertaken from the point of view of assisting the States in the establishment of child hygiene departments. The success attained in the establishment of such a department in Missouri where an officer of the service has served temporarily as director of the department with the assistance of personnel employed by the service, makes it obvious that this is one of the many fields in which the service can give splendid help to the State health departments. There is hardly a question before the country to-day which is so important as that of child hygiene, including as it does, prenatal care, infant welfare, and personal hygiene prior to school age. The service is now receiving a number of requests for assistance similar to that which has been rendered in Missouri, and believes that work in this field alone justifies a much larger appropriation for field investigations.

Among the interesting results secured during the last year is the apparently beneficial use of a preparation of chaulmoogra oil in the treatment of leprosy. The ethyl esters of the various fatty acids of chaulmoogra oil are given hypodermically in connection with the oral administration of the fatty acids themselves, usually combined with iodine. It is too early to know positively whether this treatment is a permanent cure for the disease, but under it a large number of patients have become bacteriologically negative and have been allowed their freedom. Within a few months a national leprosarium will be in operation. The development of this treatment at the present time offers, therefore, great promise for the relief of patients at this leprosarium, and possibly for their cure.

The studies of the service in regard to the cause and prevention of pellagra have been continued. The great contribution made to medical science as a result of the work in this field has been mentioned in previous annual reports. It is now known that pellagra is not infectious and is not caused by eating spoiled corn. It is evidently caused by a dietary fault, the precise nature of which is not yet known, but from the point of view of prevention the knowledge that the disease can be avoided by the consumption of a well-balanced diet, including plenty of fresh meat, milk, and green vegetables, is the important fact. Pellagra has decreased in the South, owing to better economic conditions, but a great need still remains for popular instruction as to the means of preventing this disease and for a continuation of field studies bearing on the matter.

On request of the Bureau of Mines, an officer was detailed to that bureau for the purpose of supervising investigations conducted by them which have a public health aspect. This is only one example of the desire on the part of the service to cooperate with other Government departments with a view to the avoidance of duplication of activities.

One of the striking facts learned in the course of mobilization in this country was that malaria could be prevented in mobilization camps by the use of proper methods of drainage and oiling. This

information has been employed during the past year in developing a cooperative campaign for the control of malaria in Southern States. The State and local health organizations and the Public Health Service have had the assistance of the International Health Board of the Rockefeller Foundation in this campaign. The service details engineers to each State who make surveys on the basis of which definite recommendations for malaria-control measures can be made. Malaria is the most serious disease in a large section of this country. The eradication of this disease from those sections where it is prevalent would promote the economic prosperity of the country. It is, therefore, of the greatest importance that an adequate appropriation be made for demonstrations in rural sanitation, which can be used both for demonstrations in public health administration in rural districts and for cooperation with the States in a comprehensive and well-concerted attack upon malaria. The most effective measures to meet this problem are known, but up to the present time funds have been lacking for adequate demonstrations of these measures by the Federal Government.

In connection with the treatment of discharged soldiers, the service has undertaken extended studies in tuberculosis at certain hospitals of the service and at the Hygienic Laboratory. These studies are along three lines: (1) Chemotherapeutic studies; (2) specific immunity studies; (3) studies of the relation between nutrition and tuberculosis. The studies have been planned carefully after consultation with many of the experts on the disease.

Special studies of and demonstrations in rural sanitation were continued during the fiscal year. Although the work was considerably curtailed owing to the reduction in the appropriation, cooperative demonstrations were carried on in 11 States with money from local or State sources in the proportion of about \$5 for every dollar allotted from Federal funds. These cooperative activities have greatly stimulated public interest in the primary object of this work, i. e., the establishment of permanent, adequate health organizations in the various counties.

Under an opinion of the Solicitor of the Treasury arsphenamine (including salvarsan) is regarded as a product coming under the law of July 1, 1902, regulating the sale of viruses, serums, toxins, and analogous products in interstate traffic. This has enabled the service to take over the supervision of the manufacture and importation of arsphenamine, which was supervised during the war by the Federal Trade Commission under regulations prepared by the service. The fact that to-day the American product is equal if not superior to that imported, and that it is being used with few untoward results, is sufficient demonstration of the value of the supervision exercised by the service. It is believed that few activities of the service can so safeguard the public health as supervision of viruses, serums, toxins, and analogous products. These preparations are assuming increasing importance in the prevention and cure of diseases and threaten dangerous consequences if allowed to be sold in a contaminated condition.

Field investigations of industrial hygiene and sanitation have been carried on during the past year through the Office of Indus-

trial Hygiene and Sanitation and have included (1) surveys of occupational health hazards, (2) studies of special occupational diseases, and (3) investigations of working conditions in Government buildings. A consulting service on occupational diseases and health safeguards has also been available for industries and industrial workers and State and municipal authorities. On request of the United States Employees' Compensation Commission and under authority of the law establishing that commission, the service, through the Office of Industrial Hygiene and Sanitation, has detailed medical officers to serve at various Army depots for the purpose of furnishing medical and surgical care to civilian employees injured in line of duty. At the present time about 15 officers are performing this work. Plans are under way for the use in post offices and other Federal buildings of first-aid kits. The service will also furnish instructions in first aid to the employees placed in charge of the kits.

The preceding summary merely touches upon a few of the significant features of the division's work during the past year. A detailed account of this work follows:

BOTULISM.

At the request of Stanford and California Universities, indorsed by the California State Board of Health, Epidemiologist J. C. Geiger was detailed in January, 1920, to assist these universities and the National Cannery Association in an epidemiological study of botulism in California. This study has been conducted along the following lines:

1. Bacteriological study of the various strains of *B. botulinus*, both in cultures and in animals.

2. Field study of outbreaks with correlation by bacteriological studies of probable distribution of *B. botulinus* in nature.

3. Toxin and antitoxin studies; thermal death point.

That part of the study concerning field investigations of the disease was undertaken by the service in accordance with the following plan:

1. Review of old and recent outbreaks.

- (a) Cause—vegetables. Method of canning.

- (b) Contributory factors, as soil, insects, hog carriers.

- (c) Clinical manifestations.

- (d) Treatment; recovery; complication, if any.

- (e) Pathology, autopsy finding, if any.

2. Forage poisoning.

- (a) Feed, ensilage, hay, filtrate of emulsion of food.

- (b) Symptoms.

- (c) Autopsy findings.

3. Limberneck.

- (a) If caused by spoiled home-canned goods, what vegetable.

Work with respect to the standardization of the antitoxin is now in progress (see Hygienic Laboratory report, p. 77).

Upon the request of the State health officers investigations of the disease were extended into Arizona and Oregon.

"DEER-FLY" FEVER.

In response to a request by the State health commissioner of Utah, Surg. Edward Francis was detailed in April, 1920, to resume his investigation of the disease known as Pahvant Valley plague, or "deer-fly" fever, which appears to be limited to certain portions of Utah. As a result of combined field and laboratory studies, Dr. Francis has shown that the disease is probably due to an organism first described by service officers under the name of *B. tularensis*. It was also demonstrated that the host was the jack rabbit. Studies still in progress would apparently indicate that the infection is carried from jack rabbit to man by means of the deer fly.

EPIDEMIOLOGICAL AND STATISTICAL STUDIES OF INFLUENZA.

The epidemiological and statistical studies of influenza which had been begun in the previous year were continued under the general direction of Surg. W. H. Frost, the statistical phases of the work being carried on at the statistical office under the immediate supervision of Statistician Edgar Sydenstricker. These studies were conducted along three general lines. One was the continuation of the statistical analysis of the results of the field studies made in 1918 and the early part of 1919 of certain data loaned to the Public Health Service by State departments of health, and of published data relating to the mortality from the epidemic of 1918-19. A second line of study was made necessary by the reappearance of epidemic influenza in January, 1920. In order to have a basis for comparison of the epidemic of 1918-19 with that of 1920, a field force was organized in Baltimore for a resurvey of about 35,000 persons who had been included in the surveys made in 1918-19. The results of this resurvey are now being tabulated. A third line of study was also made possible by the recrudescence of influenza, namely, some specific inquiries into certain clinical and epidemiological phases of the disease in 1920. Epidemiologic aides¹ detailed by the Public Health Service to several State health departments were utilized for this purpose.

MALARIA.

Activities of the malaria field force have been continued under the direction of Surg. L. D. Fricks, with headquarters at Memphis, Tenn.

Investigations of malaria control during the past fiscal year may be conveniently grouped as follows: (a) Advisory supervision of malaria-control demonstrations previously made, (b) investigations of malaria as affecting railroads engaged in interstate traffic, (c) cooperative demonstration studies of malaria control.

ADVISORY SUPERVISION OF MALARIA DEMONSTRATIONS PREVIOUSLY MADE.

The policy of the service has been to discontinue active supervision of malaria-control demonstrations at the end of the first season's work, or as soon thereafter as possible, leaving their maintenance to

¹ See p. 104.

the local authorities or commercial concerns interested, but, when requested by the State health authorities, to continue advisory supervision and make such reinspections of the work as may be necessary to insure its successful completion. Eighteen communities have continued the antimalaria control work which was initiated by the service as an extra-cantonment health measure. From incomplete reports received, 41 other communities which have been interested in malaria control through demonstrations previously made by the Public Health Service have continued active work during the past fiscal year and contributed \$138,000 for this purpose. Many of these places have been inspected from malaria field headquarters and given such advice, encouragement, and support in securing local appropriations for this work as has been found necessary for its proper maintenance.

INVESTIGATIONS OF MALARIA AS AFFECTING RAILROADS ENGAGED IN INTER-STATE TRAFFIC.

The St. Louis & Southwestern (Cotton Belt) Railroad was the first in the United States to undertake malaria control on an extensive and permanent scale. This work was begun in 1917 under the direction of Associate Sanitary Engineer W. H. Van Hovenberg with an appropriation of less than \$3,000. This road is willingly spending \$41,150 this year for malaria control among its employees, and \$15,000 additional has been contributed by different towns along the road under a cooperative plan for mutual malaria protection. This sum is three times greater than any annual allotment from Federal appropriations for malaria-control investigations made previous to 1918.

During the past fiscal year a malaria survey of the Central of Georgia Railroad was made and an estimate of the cost of malaria protection for its employees was prepared by a sanitary engineer of the service. Following this survey and estimate, the Central of Georgia undertook to protect its employees from malaria, appropriating \$14,000 for this work during the past season.

Requests for similar surveys have been received from three other interstate railroads, and these surveys will be made as soon as personnel is available for this purpose.

COOPERATIVE DEMONSTRATION STUDIES OF MALARIA CONTROL.

At the beginning of the fiscal year a cooperative agreement was entered into between the Public Health Service, State and local health departments, and the International Health Board for the purpose of promoting and accelerating the control of malaria in the United States. Under this agreement the Public Health Service was expected to make malaria surveys, prepare estimates of cost of malaria-control measures, and furnish supervision of the control demonstrations, the State health authorities selecting the areas in which these demonstrations were to be conducted and, together with the local health authorities, providing necessary funds to cover the cost of the control measures employed. In instances where the State and local authorities were unable to provide the necessary funds, these were to be supplemented by the International Health Board.

Working under this agreement, it has been possible to extend malaria-control investigations into 11 States. One hundred and thirty-three communities were surveyed, out of which 43 towns were selected as being suitable for malaria-control demonstrations. These towns were selected with a view to securing adequate malaria control in communities having a high malaria rate at a relatively low per capita expenditure of money and because of the probability of future maintenance, thereby giving widest publicity to the possibility of mosquito and malaria control at a reasonable cost and on a practical basis.

The summer of 1920 being the first in which cooperative malaria-control investigations were undertaken in these towns, it is too early to make an exact determination of results obtained in improved health conditions, but expressions of private opinion from citizens concerned are of universal approval. These expressions are based not alone on improved health conditions, since the full tide of this improvement has not yet been reached, but are also influenced by the more favorable living conditions made possible through mosquito destruction.

In reply to an inquiry sent out from malaria field headquarters reports were received of expenditures amounting to approximately \$300,000 by local communities for malaria control during the fiscal year. These reports are by no means complete, including, as they do, only those communities which are known to have been influenced in carrying on this work through service activities. They do not include many communities which have been indirectly persuaded of the importance of malaria control through these demonstrations or thousands of individuals who have been awakened to the value of protecting themselves from malaria mosquitoes and informed of practical methods for preventing malaria infections under normal living conditions. This report of expenditures by local communities, however, is highly gratifying as an index of the awakening public sentiment for malaria control.

The following statement bearing upon the value of malaria-control demonstrations, their progress and the change in public appreciation thereof is made by Senior Sanitary Engineer J. A. LePrince, who has had direct supervision of these demonstrations since they were first undertaken by the service. It is believed that this statement is conservative and that the favorable change in public sentiment as noted by Mr. LePrince is worthy of careful consideration by all who are interested in improved health conditions in the United States.

Malaria fevers cause an annual loss of efficiency each year in our country that is appalling and the communities that suffer lack interest in public welfare. In many villages and towns from 10 to 40 per cent of the inhabitants are infected. Where such conditions obtain the community can not and does not progress or develop normally.

It has been definitely demonstrated that many of the localities so affected can eliminate malaria at a reasonable cost and that the best way of inducing the public to do so is to carry on carefully planned demonstration campaigns in badly infected areas. The result of such campaigns means a larger annual income for the community, the county, the State and the Federal Government. Preventive malaria work is in reality a sound business investment. Up to 1913 no county or State made any appropriation for malaria control operations, although the value of such work was proved 12 years previously.

As a result of the malaria investigation work directed by the United States Public Health Service, the public viewpoint has changed—villages, towns,

county and State officials as well as business corporations and railroads now realize the extent of the large preventable financial loss they incur each year, and steps are being taken by them to prevent it. In 1913 one single demonstration control campaign was started. In 1914 congressional appropriations permitted an allotment of \$17,000 by the service for malaria-control investigations. The people have been watching the campaigns undertaken and throughout the country they are becoming more and more interested in having their own community and State undertake this work.

During the past fiscal year 64 separate communities carried out malaria control campaigns and appropriated \$280,000 therefor. Nearly all of these places will continue to maintain this freedom from malaria by proper safeguards because they find it a good investment to do so. This calendar year 101 places are doing work under the supervision of the United States Public Health Service and have already appropriated about \$350,000 therefor. Several States for the first time in history have made annual appropriations for malaria control and other States contemplate doing so. Two railroads are spending for malaria elimination this year more than four times the Federal allotment referred to—their past experience shows that it pays to do so.

Industries in infested areas report from 10 to 40 per cent increased output after control measures are in operation. Chambers of commerce report new industries establishing branches in towns where the elimination of malaria has rendered local labor more efficient, and factory managers report that since malaria-control measures were carried out there is a more steady supply of labor, that the quality of labor has improved, and the earning capacity of the laborer increased. Lumber-mill corporations have willingly contributed from \$1,000 to \$10,000 toward local antimalaria campaigns and state it pays them well to make such an investment. Because of the change of ideas concerning the cause and possibilities of prevention of malaria, there is a marked improvement in the method of screening of houses in malarial districts, and the percentage of houses kept efficiently screened has increased very largely. In sections where the hotels at seashore resorts were formerly filled only in the non-fever season, the proprietors report as a result of malaria-control measures they now have all the business they can handle throughout the entire year.

Considering the fact that a few years ago hundreds of communities were seriously affected and with no apparent relief in sight, that the public in general had had no visible proof of the possibilities of malaria eradication, and too large a proportion of our public was wrongly informed regarding the cause of malaria, it is gratifying to note that this year over a hundred of these same places have decided to finance campaigns for malaria elimination. They have already appropriated from this season's work nearly twenty times as much as the original annual Federal appropriation 1914-1917.

It is even more encouraging to note that there is a strong demand for State and county aid along these lines, and that such support has already been given and has the approval of the public. What is also important is that a large part of the public now realize that it costs them much more to continue to suffer and support the financial loss caused by malaria than it does to eliminate the disease from their community.

SCIENTIFIC INVESTIGATIONS.

The investigations of more purely scientific malaria problems in contradistinction to malaria-control investigations may be conveniently grouped under two general heads: (*a*) Laboratory investigations and (*b*) field investigations. These investigations are closely correlated and frequently a problem has been taken up in the field and carried back to the laboratory, or vice versa.

LABORATORY INVESTIGATIONS.

At the beginning of the fiscal year the malaria laboratory was removed from New Orleans to Memphis, Tenn., and established in quarters supplied by the medical school of the University of Tennessee, to the mutual advantage of the service and the university. The

following biological studies have been conducted during the present year:

(a) *Longevity of mosquito life*.—A method of keeping mosquitoes alive in the malaria laboratory has been productive of securing a maximum longevity far in excess of any hitherto recorded. A species of *Culex* has been kept alive for over eight months and a species of *Anopheles* for more than six months.

(b) *Viability of malaria parasites in mosquitoes*.—Investigations made of the length of time required by malaria parasites in the mosquito to lose their virulence have shown that under some circumstances *Anopheles* mosquitoes lose their power to convey infection after two months, although malaria parasites were present fully 15 days longer.

(c) *The ultimate seasonal infection of malaria mosquitoes*.—Biologist Bruce Mayne continued the investigation of malaria infection in mosquitoes as affected by temperature with a view to determining when, at the close of the summer season, mosquitoes are no longer capable of becoming infected. These investigations are of considerable practical importance since they offer a means of determining the time at which sanitary measures may be safely discontinued in a malaria district.

Late in the year Dr. M. A. Barber, of international reputation in malaria-mosquito investigations, was appointed director of the malaria laboratory. He at once outlined a program for the investigation of many practical problems in malaria, and steps were taken to increase the effort of the laboratory and field force during the next fiscal year.

FIELD INVESTIGATIONS.

Field investigations of malaria problems have been conducted along the following lines: (a) Rice-field investigations, (b) study of impounded waters, (c) economic loss from rural malaria and quinine administration in its control, (d) investigation of plants affecting mosquito production, (e) investigation of fish in mosquito control, and (f) investigation of feeding habits of *Anopheles* mosquitoes.

(a) *Rice-field investigation*.—The investigation of the relation of rice culture to the prevalence of malaria and the propagation of *Anopheles* mosquitoes was continued during the fiscal year by Plankton Expert W. C. Purdy. It was found that very little breeding of either *Anopheles* or *Culex* mosquitoes occurred in the rice fields under investigation near Chico, Calif., but that considerable breeding took place in the drainage ditches and seepage puddles near by. This very important determination, which is entirely at variance with the conditions previously found in the rice fields of Arkansas and Louisiana, appears to be due to the method of irrigation employed in California and the consequent general stagnation of water in these rice fields.

(b) *Study of impounded waters*.—The investigation of the influence of the artificial impounding of water on the prevalence of malaria, begun in 1914, was continued during the year, although to a somewhat restricted extent, because of other more pressing activities. A small number of new surveys were made upon request of State and

local health officials and advice given as to the probable effect of impounded water on malaria prevalence in these localities. The impounded projects which had been previously surveyed, under the direction of Asst. Surg. Gen. H. R. Carter, will be kept under surveillance and reinspections made during the year, with a view to determining any alterations occurring in malaria prevalence in contiguous territory.

(c) *Economic loss from rural malaria and quinine administration in its control.*—A very important investigation was conducted in Mitchell County, Ga., for the purpose of determining the actual loss sustained from malaria by the residents in an area of 25 square miles of farming territory. The amount lost from malaria in the area under observation because of inability to cultivate and gather crops, plus the amount paid out for doctors' bills and drugs, averaged \$11.50 per acre under cultivation during 1918. In a near-by control area of similar size the economic loss from malaria amounted to \$15.50 per acre during 1919, while the loss in the original area under investigation was reduced from \$11.50 in 1918 to \$1.50 in 1919, mainly through quinine supportive treatment.

In cooperation with the State health officer of Georgia, effort was made to extend quinine treatment to a large proportion of the rural inhabitants of Mitchell County, Ga., through the establishment of free dispensaries located at convenient points throughout the county. Ten permanent dispensaries were established, and the standard treatment for malaria² as recommended by the National Malaria Committee was administered to 4,000 people, 71 per cent of whom gave a history of having had malaria within the past three years. Of the 4,000 persons receiving quinine treatment only 34 developed acute attacks of malaria up to the end of June, 1920, while less than 1 per cent of the persons who began taking quinine discontinued its use before completion of the treatment. These dispensaries met with the enthusiastic support of the people of Mitchell County, and will be continued through the present season.

(d) *Investigation of plants affecting mosquito production.*—Isolated observations have been made showing that in certain instances the abundance of mosquito production bears a close relation to the character of aquatic vegetation found in the streams and pools in which mosquito breeding occurs. In order to determine to what extent various kinds of aquatic growth influence larvæ abundance, and how far any one growth may be depended upon as a means of inhibiting mosquito production, a detailed study of this matter was undertaken at the beginning of the present fiscal year. These investigations up to the present time have included parrot feather or milfoil (*myriophyllum*), duck weed (*lemna*), cat-tail (*typha*), eel grass (*vallisneria*), ditch grass (*ruppia*), primrose willow and smartweed (*polygonum*). Apparently some of these plants are inimical to full larvæ production. Investigation of the factors responsible for this desirable condition of affairs will be carried on as rapidly as possible. In the case of those plants favoring mosquito production investigations are being made for the purpose of determining the best means for their removal or control.

² Vol. 34, No. 52, Dec. 26, 1919.

(e) *Investigation of fish in mosquito control.*—Continuing the very careful investigations made by Ichthyologist Samuel F. Hildebrand, Bureau of Fisheries, at Augusta, Ga., during the summer of 1918 in the employment of top minnows, *Gambusia affinis*, in the destruction of mosquito larvæ, Mr. Hildebrand was again detailed to cooperate in the field investigations of malaria control during the present fiscal year. This cooperation has been most valuable, and has been conducted along the following lines:

(1) Installation of *Gambusia* hatcheries to be operated by State health departments of the different States in which cooperative malaria-control investigations are being conducted.

(2) Establishment of hatcheries and the giving of advice to sanitary engineers and local officials in the employment of *Gambusia* in mosquito control in those areas in which antimalaria operations are being conducted. Each area has been visited by Mr. Hildebrand and the cost of drainage and oiling operations greatly reduced in some through the employment of top minnows. In Dyersburg, Tenn., it was found that out of an initial estimate of \$5,000 for drainage, \$2,000 was saved by the employment of *Gambusia*. At Athens, Tex., it was estimated that \$3,000 would be required for antimalaria and mosquito control. It developed, however, that this sum could not be raised, and this place being suited for fish control it was converted into an experimental fish-control area with only a very small expenditure for labor in cleaning stream and pond edges.

(f) *Investigation of feeding habits of Anopheles mosquitoes.*—The observations of Collaborating Biologist C. W. Metz on the possibility of using mosquito traps in antimalaria work, which were conducted in 1918, showed that *Anopheles* mosquitoes, while searching for a blood meal, are sensibly attracted by some of the larger domestic animals. Hogs were employed by Mr. Metz in his observations. The practical importance of an observation of this character is apparent, and for this reason the investigations begun by Mr. Metz have been resumed during the present season. No conclusions, however, have yet been arrived at as to the feasibility of employing hogs and other domestic animals around rural homes as a protection against malaria mosquitoes.

EDUCATIONAL AND PUBLICITY MEASURES.

At the beginning of the year an inexpensive malaria exhibit was prepared at malaria field headquarters for exhibition at State and county fairs and similar gatherings. This exhibit consisted in the main of charts, diagrams, and placards showing how malaria is transmitted, what it has cost in many communities, and how it may be controlled, together with models and living specimens of mosquitoes, larvæ, and fish. This exhibit was shown at numerous agricultural fairs, medical meetings, Y. M. C. A.'s, and school conventions, and met with widespread approval. Many requests were received for its use, which could not be met because of conflicting dates and lack of duplicate exhibits.

A strong effort was made to have the different State health departments of the malaria States prepare similar exhibits for use within their borders, particularly at county fairs, since they would there reach the very people most concerned in malaria and its

control. It is most unfortunate that Federal funds were not available with which to prepare a standard malaria exhibit which could be copied and widely used by the different State health authorities.

In connection with the cooperative malaria control investigations being conducted in 43 places, educational and explanatory lectures were given from time to time by the sanitary engineers in charge of this work; also, bulletins and publications dealing with malaria have been judiciously distributed to interested persons as a means of educating them in the importance of malaria and the proper methods for its control. Every effort has been made to give local publicity to malaria-control investigations in these different communities through the local press. News items giving reports of the progress of the work have been prepared by the sanitary engineers and comments from interested citizens have been invited. In every instance the control investigation has been given local color and every effort made to impress the community with the fact that after it has been shown how malaria can be controlled the responsibility for protecting itself from this disease rests upon its own people.

A model mosquito ordinance for municipalities, suggesting in substance desirable and effective legislation, has been published in the Public Health Reports.³

PELLAGRA.

FIELD INVESTIGATIONS.

At the close of the fiscal year 1919 the following field investigations under the direction of Surg. Joseph Goldberger were under way:

1. A study of the value of single foods in the prevention of pellagra.

2. A study of factors influencing pellagra incidence in selected cotton-mill villages.

The study of the pellagra-preventive value of certain single foods when supplementing the ration of a group of inmates in an asylum in which cases of pellagra were ordinarily of frequent occurrence, begun about January 1, 1918, has been continued since and was in progress at the close of the fiscal year 1920. This study has afforded valuable, indeed well-nigh conclusive, evidence that neither a deficiency in the antineuritic nor the fat-soluble vitamine is an essential factor in the production of the disease, thus contributing in an important degree to the eventual determination of the essential etiological dietary factor in this disease.

General observations first begun in the fall of 1914 on the preventability of pellagra by diet, much reduced in scale when the preceding study was begun, have been continued throughout this period and have afforded additional confirmatory evidence of the essential controlling effect of diet.

The foregoing studies have been carried on at the Georgia State Sanitarium with the invaluable cooperation of its trustees and officers under the immediate charge of Passed Asst. Surg. W. F. Tanner.

The study of factors affecting pellagra incidence in textile-mill communities was continued throughout the year with headquarters,

³ Vol. 35, No. 14, Apr. 2, 1920.

as in the preceding three years, at Spartanburg, S. C., and in the immediate charge of Passed Asst. Surg. G. A. Wheeler. The collection of field data was, as in the second half of the preceding year, confined to one village, this village having thus been under continuous surveillance since May, 1916. This continuous observation will permit the study of the relation of the annual fluctuations in pellagra to various economic and other factors.

A number of papers embodying results of the field studies of pellagra have been published during the year or are now in press.

SPECIAL STUDIES OF PELLAGRA AT SPARTANBURG, S. C.

The special studies of pellagra begun in 1914 were continued throughout the year at the service hospital and laboratory at Spartanburg, S. C. These studies have been conducted under the general direction of Surg. Joseph Goldberger, with Passed Asst. Surg. G. A. Wheeler in local charge.

Clinical studies.—As in previous years, the clinical studies were conducted under two heads, the hospital proper and the out-patient clinic.

The hospital patients were resident in the hospital throughout the period of treatment. The out-patients were required to visit the hospital for the noon-day meal, at which time they were examined and, once each week, weighed. No effort was made to control the diet other than the midday meal.

Two dietary combinations were used in the treatment of patients during the greater portion of the time, a "special" diet which included milk, soft eggs, cereals, soups, soft toast, etc., and a "standard" diet in which were included generous allowances of corn bread, biscuit, fresh meats, milk, eggs, vegetables, and fruits. All new admissions were placed on the "special" diet for a variable period, depending upon the degree of gastro-intestinal involvement. In most instances they were transferred to the "standard" after the third day in the hospital. The meal furnished the out-patients was identical with the "standard" dinner served the hospital patients. The diet of a few individual patients was varied from time to time to meet suggestions arising in the course of the treatment.

With the exception of occasional medication in a small percentage of the cases, the treatment was purely dietary and, as in previous years, the results were entirely satisfactory. Those cases remaining under treatment for any considerable length of time had apparently made a complete recovery at the time they were discharged from the hospital.

A history was secured and a physical examination made of each hospital and out-patient, and daily clinical and dietary records kept. During a portion of the year the amount of food actually consumed by each patient was determined. Weekly weighings were made and recorded for each patient. Both routine and special examinations of the blood, stomach contents, stools, and urine of all pellagra patients were made by the laboratory technician. During the first few weeks of the year an artist was engaged in sketching the pellagrous skin eruption as presented at the time of admission and at various stages of the treatment.

The number of patients treated and the results are given in the following summaries:

Hospital.

Under treatment at beginning of year-----	26
Admitted during the year-----	74
Total treated-----	100
Discharged during the year-----	91
Remaining under treatment at end of year-----	9

Out-patients.

Under treatment at beginning of year-----	3
Admitted during year-----	4
Total treated-----	7
Discharged during the year-----	6
Remaining under treatment at end of year-----	1

Of the 91 patients discharged from the hospital during the year, 67 recovered, 1 improved, 3 left against advice after a very brief stay in the hospital, 1 was transferred to an insane asylum because of violent mental symptoms, 1 died, and 18 were discharged for the reason that the previous diagnosis of pellagra could not be confirmed.

Studies to determine the efficacy of commercial skim-milk powder in the treatment of pellagra were inaugurated early in May, but, owing to the marked reduction in the number of admissions for May and June, the number of cases observed was too small to justify definite conclusions. These studies are being continued.

Chemical laboratory.—The work of the chemical laboratory consisted of the study of saliva for phenols, uric acid, and sulphocyanate; of the study of urine for total nitrogen, urea, uric acid, creatinine, and physiological bases; and the study of the alkali reserve of the blood and the tolerance to sodium bicarbonate. The results of these studies are partly in press and partly in preparation for publication.

TRACHOMA.

The trachoma prevention work has been conducted in much the same manner as in previous years, the hospitals being used as a base for the treatment of the more chronic cases. It has been practicable to carry on the work more extensively than ever before by means of trachoma surveys and field clinics. While it has been possible to secure the services of a few additional doctors and nurses, the work has suffered for the want of additional personnel and sufficient money, and many requests for trachoma surveys and clinics have necessarily been refused.

Hospitals.—Five hospitals have been in operation during the fiscal year. The hospital which was formerly located at Welch, W. Va., and was closed during the influenza epidemic, has not been relocated, due to the lack of assistants to make the necessary surveys, and to the depleted condition of the appropriation under which this work is being conducted.

The hospital at Tazewell, Tenn., which was established there in August, 1916, has, during its four years' location there, had a large clinic and has practically treated and cured all trachoma cases that it has been possible to induce to accept treatment. The hospital will therefore be removed to Morristown, Tenn., shortly after the close of the fiscal year.

The hospitals at Jackson and Greenville, Ky., treated more cases than usual during the past year.

The Pikeville hospital is taxed to its capacity most of the time. This hospital will accommodate about 25 eye patients, but many more could be treated if room were available.

The hospital at La Moure, N. Dak., has been treating patients from the surrounding country. The reports from the medical officer in charge of this hospital indicate that the patients with trachoma there are usually well nourished and apparently respond more readily to treatment than some of the patients in the Appalachian Mountain hospitals.

As has been true formerly, the patients in these hospitals have come from various points in the United States, traveling hundreds of miles, seeking treatment for this disease and its effects.

Since these trachoma hospitals have been opened, the first two of which were established in the fall of 1913, between nine and ten thousand cases of trachoma have been treated at the hospitals; of this number about 4,000 have been reexamined by the doctors and found to be cured. Many other cases, however, live at a distance and in isolated communities and after receiving relief do not return for a final examination and the result in their cases is therefore not on record in the hospital. It would be a conservative estimate to state that at least 8,000 cures have been effected.

The following table presents the dispensary and hospital treatment during the year:

Dispensary and hospital relief, operations, etc.

	Green- ville, Ky.	LaMoure, N. Dak.	Jackson, Ky.	Pike- ville, Ky.	Taze- well, Tenn.	Total.
DISPENSARY RELIEF.						
Old cases, all causes	595	527	2,073	1,253	1,493	5,941
Old cases, trachoma	418	355	1,378	787	818	3,756
New cases, all causes	566	707	1,010	1,341	830	4,454
New cases, trachoma	183	88	222	259	195	947
Total attendance	1,161	1,234	3,083	2,594	2,323	10,395
Total number of treatments	1,167	1,234	3,636	2,983	2,356	11,326
Average daily attendance	3.2	4	9.8	8.3	7.4	33.2
Cases impaired vision from trachoma	87	64	141	233	98	623
Cases corneal opacity from trachoma	46	23	63	51	35	218
Cases blindness, both eyes, from trachoma	3	0	0	6	1	10
Cases blindness, one eye, from trachoma	12	0	6	20	3	41
Cases ulcer from trachoma	42	4	42	40	17	145
Cases pannus from trachoma	47	19	70	133	26	295
Cases entropion from trachoma	44	4	20	25	14	107
Cases trichiasis from trachoma	16	2	32	19	7	76
Cases photophobia from trachoma	65	25	139	187	84	500
Cases conjunctivitis	142	105	425	510	475	1,657
Cases glaucoma	3	0	0	0	0	3
Cases trachoma cured	86	92	73	45	115	411
HOSPITAL RELIEF.						
Cases remaining from previous year	7	6	9	19	23	64
Cases admitted during year	188	188	242	295	290	1,203
Cases discharged during year	186	186	241	299	305	1,217
Cases remaining at close of year	9	8	10	15	8	50
Days relief furnished	2,265	3,091	3,414	6,599	6,228	21,597
Rations furnished	4,023	4,482	4,787	9,198	7,819	29,309
Cost of rations furnished	\$2,699.67	\$1,676.79	\$2,861.19	\$3,731.93	\$3,128.29	\$14,067.87
OPERATIONS.						
Operations under general anesthesia	39	24	25	63	40	191
Operations under local anesthesia	114	87	183	230	241	855
Operations with grattage method	113	105	204	227	256	905
Operations for entropion	37	6	20	19	20	102

District work.—District work in connection with the hospitals has been hampered because of the difficulty experienced in obtaining transportation for the doctors and nurses in outlying districts.

Out of 5,195 persons examined in territory surrounding the stations, 231 cases of trachoma were found.

The records of the hospitals show that between 1 and 2 per cent of trachoma cases have been blinded in both eyes, and over 4 per cent have been blinded in one eye. In other words, between 5 and 6 per cent of the cases suffered the loss of either one or both eyes as the result of trachoma. One-half of all the cases show impairment of vision ranging from slightly defective vision to total blindness. The ages of the patients ranged from infancy to old age.

The importance of routine school surveys and other methods of detection of the presence of trachoma can not be too strongly emphasized, as early treatment of the disease is more effective.

Field clinics.—Surveys and field clinics have been made in a number of States, including Missouri, Texas, Ohio, Alabama, Florida, South Carolina, Kentucky, Tennessee, North Dakota, and Nebraska. There have been 55 field clinics conducted at which 20,882 persons of all ages were examined; of this number 1,330 were found to have trachoma while 480 were suspicious of this disease.

While some of these clinics were conducted in modern hospitals, many of them were conducted in rural districts, in the county courthouse or other available buildings which could be used as temporary hospitals. In this manner trachoma cases were reached which would otherwise have gone untreated.

There were 1,526 operations performed at the field clinics, 1,156 of which were performed under general and 370 under local anaesthesia. The service method of diagnosing and treating trachoma was demonstrated to a total of 250 physicians who were in attendance. One hundred and twenty-nine public-health talks were made to audiences (estimated) of about 10,000 and 10,000 trachoma pamphlets were distributed. A total of about 2,500 trachoma cases have been treated and operated on during the year at both hospital and field clinics.

Surveys made by the service during the year may be classified as follows:

Surveys made by the United States Public Health Service.

	Missouri.	Texas.	Ohio (Scioto County).	Alabama.	Florida.	South Carolina.	Total.
Counties examined.....	7	6	1	5	16	1	36
Schools examined.....	31	112	125	124	7	33	423
Number examined, all ages.....	4,472	24,036	10,741	9,539	2,682	2,210	52,491
Trachoma cases found.....	358	235	224	337	145	153	1,163
Suspicious cases found.....	.....	106	87	.....	86	64	305
Percentage trachoma.....	8	.14	2.9	3.5	8.5	9.8	2.79
Operations performed.....	.....	.....	129	.....	202	66	397
General anesthesia.....	.....	.....	82	.....	123	46	251
Local anesthesia.....	.....	.....	47	.....	79	20	146

Several of the States have appropriated money for trachoma work. The State of Ohio has established a trachoma bureau under the department of health, with an eye specialist in charge, and is conducting an intensive campaign of trachoma eradication and prevention.

In the city of Cincinnati all of the school children were examined in the spring, a total of 52,130 children. Among this number were found 141 cases of trachoma and 75 which were diagnosed as suspicious. This examination was made principally by the physicians of the State trachoma bureau. The survey, however, was made under the direction of this office, the ophthalmologists of Cincinnati cooperating, and an assistant was furnished a small portion of the time for the purpose of systematizing the diagnosis. Upon the completion of the survey, clinics were arranged at the Cincinnati general hospital and the trachoma cases were operated on by a representative of the service and the Cincinnati schools were freed of trachoma.

Other cities in the State of Ohio, including Columbus, Portsmouth, Gallipolis, Chillicothe, etc., have been surveyed by the Ohio Trachoma Bureau and clinics arranged for the treatment of the trachoma cases. These operative clinics have all been held by a representative of the service. The trachoma work is to be continued along these lines.

The State Legislature of Kentucky recently appropriated \$13,000 for a trachoma bureau which is to be organized for cooperation with the service in trachoma work. Other States also have made appropriations and contributions for furthering the campaign against this disease.

ETIOLOGY OF TRACHOMA.

Acting Assist. Surg. F. B. Eaton was detailed in July, 1919, to investigate the possibility of an animal scar-tissue conjunctivitis of insect origin etiologically related to trachoma. This investigation was limited to three counties in the mountain regions of Kentucky. The results, while inconclusive, uncovered no evidence in support of the hypothesis that biting flies and equine conjunctivitis are agencies in the etiology of trachoma.

TYPHOID FEVER.

TYPHOID INVESTIGATION AT CALEXICO, CALIF.

On request of the secretary of the California State Board of Health, Surg. J. R. Hurley was detailed in June, 1920, to make a special investigation of the typhoid and other sanitary conditions at Calexico, Calif. Typhoid fever was not found to be epidemic in Calexico, but the disease was reported to be endemic and widely epidemic in the contiguous town of Mexicali, Mexico, and other points south of the border, principally among Japanese who drank the raw Colorado River water from the irrigation canals. Calexico was found to have a good water system, sewage, and garbage disposal system. The milk supply and sanitary conditions on the dairy farms in the vicinity were not satisfactory, favorable conditions existing in this respect for a typhoid epidemic. The health organization was handicapped partly because of defects in the sanitary ordinances and partly because of inadequate funds and facilities.

Recommendations for the improvement of the existing conditions have been submitted to the State and local health authorities.

YAWS.

Surg. Joseph Goldberger and Surg. B. J. Lloyd were detailed to assist in the diagnosis of a suspected case of yaws in Philadelphia. The patient was a Canadian soldier, who gave a history of "rheumatism" for which he was treated in a French hospital. The diagnosis of yaws was concurred in. This case is important from the public-health viewpoint in that it suggests that exotic infections have probably been disseminated in France. Quarantine officers have been on the alert for "tropical" infections in European immigrants, both at ports of embarkation in Europe and at our own ports.

INDUSTRIAL HYGIENE AND SANITATION.

At the opening of the fiscal year the cooperative agreement in effect during 1918-19 with the Working-Conditions Service of the Department of Labor became inoperative. The Office of Industrial Hygiene and Sanitation automatically returned to its prewar assignments. Five of the six regional offices in industrial centers were closed and the personnel of the office correspondingly reduced.

Until December 15, 1919, Passed Asst. Surg. A. J. Lanza was in charge, after which date Sanitarian (R) B. J. Newman was in temporary charge with Asst. Sanitarian (R) William G. Beucler as executive officer throughout the year. Activities directed by this office included (1) surveys of occupational health hazards; (2) studies of special occupational diseases; (3) investigations of working conditions in Government buildings; (4) supervision of the medical and surgical relief work in certain plants and stations under the jurisdiction of the United States Employees' Compensation Commission; (5) consulting service to industries and industrial workers and State and municipal authorities on occupational diseases and health safeguards; (6) miscellaneous activities.

I. SURVEYS IN INDUSTRIAL PLANTS INTO OCCUPATIONAL HEALTH HAZARDS.

A. AN INDUSTRIAL CROSS-SECTION STUDY OF NEW YORK HARBOR INDUSTRIES.

I. Plant studies.—At the request of the Department of Labor of New Jersey, working conditions, as they might affect the health of employees, were studied in 12 typical industrial establishments situated along the New York Harbor, and physical examinations were made of the employees of such plants who were working in hazardous occupations. Acting Asst. Surgs. Rector, Turner, Meek, and Scientific Assts. Ward and Wright, under the immediate direction of Associate Sanitarian (R) Norris P. Bryan, were assigned to complete the study. Defects common to industrial plants were found in many departments in all the manufactories, such as faulty lighting, inadequate ventilation, insufficient and insanitary personal-service facilities, while in other departments hazards due to dust, fumes, heat, wet processes, polluted drinking water, and faulty seating were present. In four plants there was a definite exposure to lead; in two plants to formaldehyde; in four to nicotine; while zinc, carbon monoxide, antimony sulphide, and cyanide were hazards in one plant each, respectively.

Of the workers thus exposed, 345 submitted to physical examinations. In one plant where 58 men were working in lead, 38 per cent gave symptoms of lead poisoning. Of these, 22 were working in white lead and 9, or 41 per cent, showed signs of lead poisoning. Eye defects were noted in 28 per cent of those examined, while a positive diagnosis of tuberculosis was made in 1.7 per cent and symptoms suspicious of tuberculosis were found in 2.33 per cent. In fact, only 25 per cent of the workers examined were in normal physical condition.

II. Industrial clinic.—In the furtherance of the foregoing survey, and in cooperation with a local health and State labor department, an industrial clinic was established. It was open three evenings each week from 7 to 9. It served as an examining and consulting headquarters, independent of the industrial plants, and hence less liable to cause suspicion among some workers of a collusion between employers and the medical examiners. The number of examinations made was not sufficient to measure the probable permanent value of the clinic. It was noticed that many who came had chronic ailments, for which local practitioners had been unable to give relief. With the discontinuance of the survey, the clinic was taken over by the local health authorities.

B. A STUDY OF THE FOUNDRY TRADES.

Under the direction of Associate Sanitarian (R.) Norris P. Bryan and the personnel of the New York district office, including, in addition to those previously mentioned, Acting Asst. Surgs. Dyer, Jones, and Wood, and Scientific Asst. Stair, a study was begun in September into the health hazards in the foundry trades. Fourteen groups of gray-metal foundries and seven groups of brass foundries were studied. Physical examinations of 1,350 foundry workers were made. Plant surveys were carried on coincident with the physical examinations of the men. These surveys included all phases of shop-working conditions that might be, directly or indirectly, factors affecting injuriously the health of the employees. Where indication justified, special intensive studies were conducted and laboratory analyses made. The field work has been completed and the statistical and interpretive work is now under way. This study will include a report on zinc poisoning, which, from the amount of data on hand, will be more extensive than any survey in this field previously published.

C. AIR CONDITIONING.

Prof. C. E. A. Winslow, consulting hygienist in the service, assisted by Scientific Asst. Leonard Greenburg, has carried on a series of studies at the Yale Medical School, New Haven, Conn., into the rôle of dust in the causation of industrial tuberculosis. It has been found necessary to make improvements in the technique of dust sampling and analysis. Up to the present time investigations of dust conditions have been made in grinding and polishing shops, and a standard for the dust content of the air is being formulated.*

*Standards for Measuring the Efficiency of Exhaust Systems in Polishing Shops: Reprint No. 509 from P. H. R.

Studies have also been made in sand-blasting operations, with a view of determining the efficiency of the various devices for the protection of the workers against the dust hazard.⁵ These studies, the first direct quantitative studies made on respirators and helmets, have brought out the fact that by means of a helmet supplied with fresh air the dust hazard for workers in these operations may be effectively reduced.

A dust study in connection with a study of vital statistics of an industrial community has just been completed; this study—one of the few that have been made which gives actual death rates of certain occupied persons—has revealed an excessive death rate for tuberculosis among grinders of edge tools, working on grinding wheels which were continually wetted by a stream of water. Heretofore the assumption has been that “wet” grinding was not a hazardous occupation, and the recent study referred to must be considered as an important step in the detection of industrial hazards.

Studies are now in progress on various phases of ventilation work. The distribution of air by means of ventilation ducts of several types is being studied, and an effort is being made to perfect an instrument for the measurement of air flow at low velocities.

An extensive sanitary survey of a small-arms manufacturing plant has been completed; this, it is hoped, will serve to establish standards for manufacturing plants engaged in the small-part metal-working industries as a whole.

II. STUDIES OF OCCUPATIONAL DISEASES.

A. PLUMBISM IN POTTERY PRODUCTION.

This study was begun in February, 1919, at the request of the Brotherhood of Operative Potters, seconded by the Pennsylvania department of labor, who wished to ascertain the extent of plumbism among pottery workers. Centers of pottery production in New Jersey, Pennsylvania, West Virginia, and Ohio were selected, and 92 plants, employing 12,558 men and 4,739 women, were investigated. Of these workers, 1,503 men and 398 women were found to be exposed to the lead hazard. An analysis of plant working conditions and a physical examination of pottery workers, together with laboratory determinations, constituted the scope of the work done. Statistical deductions are now being completed and the report prepared for publication by Acting Asst. Surgs. William J. McConnell and O. M. Spencer and Statistician Frank M. Phillips.

Out of 1,436 men and 373 women, or 94.6 per cent, of those exposed to lead who were examined, 226 men, or 17.7 per cent, and 46 women, or 12.3 per cent—that is, 15 per cent of the total number examined—were found to have lead poisoning.

The most hazardous occupation, as shown by the record of plumbism, is that of dipping. Here 266 dippers were examined. Of these, 26.6 per cent had plumbism. Glaze mixers showed a rate of 22.9 per cent, with the odd men recording 16.2 per cent. Among the kiln men 708 were examined, with 13.8 per cent showing symptoms of lead

⁵ Devices to Protect Sand Blasters against Dust Hazards: Reprint No. 585 from P. H. R.

poisoning. The women dippers' assistants, of whom there were 148 examined, showed a rate of 12.2 per cent, and of the 63 women ware gatherers 11.1 per cent had lead poisoning.

There was a wide variance in the incidence of lead poisoning in different localities. The plants in and about East Liverpool, Ohio, gave a record of 26.5 per cent of lead poisoning, while the rate for those in and near Trenton, N. J., was 13 per cent, and in all other plants the rate fell to 6.7 per cent. The most serious hazard was in general ware, where the rate was 17 per cent. The sanitary-ware workers showed a rate of 12.3 per cent, while workers in all other wares showed only 6.7 per cent.

The relationship between plant insanitation, personal habits of the workers, and plumbism will be shown in the full report when published. It is significant that one-fourth of the plants furnished about 70 per cent of plumbism, while one-third of the plants had practically none. Indications are that there is a definite relationship between the insanitation of the first group of plants and the high rate of lead poisoning, just as also there is a close relationship between the absence of personal hygiene⁶ and the incidence of lead poisoning.

B. CUTTING OIL DERMATOSES.

In response to many requests for aid in eliminating cutting oil dermatoses among machinists, about 500 industrial plants were circularized to ascertain the extent of the dermatoses, and their willingness to cooperate in an effort to determine the cause and the necessary prophylactic measures. Research activities here were carried on by Scientific Asst. F. E. Deeds. The replies to the circular letters showed a high rate of dermatoses among machinists. Accordingly a schedule was arranged and an interpretative survey concluded in seven large plants. Workmen exposed to the oils were given physical examinations, personal habits were gone into in detail, and plant working conditions carefully studied. It is safe to assume as a result of information already received, that approximately 25 per cent of all machinists exposed to oils, are or have been affected with dermatitis, and that 20 per cent of the lesions were complicated by severe furunculosis. The lesions noted may be classified in four distinct groups. The first group is of a true papular character, occurring upon the arms, hands, and legs of the workers. The second group is a true folliculitis upon the arms, hands, and legs. The third group appears among workers exposed to kerosene or paraffin oil, and seem to be an hypertrophy of the dermic stratum corneum, together with indurated areas. The fourth group might be considered a true furunculosis originating upon the areas of the body exposed to oils and cutting compounds. This seems to be a true infection caused by pathogenic microorganisms which have been carried in the oils; it may be a secondary infection, or subacute inflammation ultimately terminating in pustules.

Bacteriological analysis of oils shows that 80 per cent of the cases observed are not of bacteriological origin. They may be due to irritant components of the oils. The investigators have been seeking to identify

⁶ "Precautionary measures to Prevent Lead Poisoning." Public Health Reports, Dec. 19, 1919; p. 2905-2907.

this irritant compound. Much work has been done, and a preliminary report is in process of preparation.

C. DERMATOSES AMONG PLATE AND PRESS PRINTERS.

A request from a Government plant led to an investigation into an alleged ink dermatosis among plate and press printers working in colored inks. Acting Asst. Surg. F. L. Rector initiated the investigation which was later assigned to Acting Asst. Surg. W. J. McConnell. Two attempts had been previously made by prominent laboratories to ascertain the cause of this dermatosis, but neither was successful.

Physical examinations were made of all the workers giving a history of dermatosis, while a certain number of physical examinations for the purpose of securing controls were made of other workers engaged at the same work place in the same occupations. Inks and soaps have been chemically examined and bacteriological and chemical analyses of the oils have been made. The lesions varied from slight erythema to ulcerations and were located on all regions of the forearms and hands, occasionally extending above the elbow. A history of erythema followed by a vesicular eruption with itching or burning, or both, was given by most. Workers having a dermatitis were found to have a dry skin—devoid of natural oiliness—while all controls had oily skins.

The experiments have not been completed, but certain ointments are being experimented with to determine their feasibility for use as a preventive treatment. It now seems probable that the dermatitis is due to certain ingredients of the colored inks, and not to the oil used; that the rough treatment to which the hands and arms are subjected in the washing processes produces abrasions of the skins, which tend to cause the dermatitis, that a dry skin predisposes to a more rapid development of the lesions and that the lesions are due to an inflammation of the skin and not to infection.

D. TELLURIUM AS AN INDUSTRIAL POISON.

The recurrence of certain symptoms among men engaged in refining metals brought tellurium to the attention of Acting Asst. Surg. Marvin D. Shie and Scientific Asst. Forrest E. Deeds, as a probable industrial poison.⁷ This metal was met with near blast furnaces in the form of fumes and dust. Investigation showed that it was taken into the body through respiratory and alimentary tracts, and probably through the skin. The predominating symptoms were, according to the investigators, "a garlic odor to the sweat and alvine discharges, dryness of the mouth, metallic taste, somnolence, nausea, vomiting, depression, constipation, and the suppression of the sweat functions." Where the latter is pronounced, the skin may become harsh and dry and a troublesome pruritus results. The first four are early symptoms and appear after small doses.

Thirteen exposed men were examined; seven showed evidence of absorption and six had a rash distributed over the body. The hazards may be eliminated by establishing hygienic conditions and by per-

⁷ "The Importance of Tellurium as a Health Hazard in Industry." Public Health Reports, vol. 35, No. 16, Apr. 16, 1920; pp. 939-954.

sonal hygiene. With the removal of the cause or the transfer of the worker, effects, except in severe cases, are not likely to persist.

E. INVESTIGATIONS INTO INDUSTRIAL FATIGUE.

Investigations into industrial fatigue were continued during the year under the direction of Senior Physiologist (R) Frederic S. Lee assisted in field studies by Associate Physiologist (R) A. H. Ryan, Associate Sanitarian (R) P. Sargent Florence and Scientific Asst. Edward M. Martin, and in laboratory determinations by Asst. Sanitary Chemist A. Baird Hastings and the volunteer assistance of Asst. Prof. Ernest L. Scott, of the College of Physicians and Surgeons, New York City. The staff was materially decreased owing to curtailed appropriations.

I. Field studies in fatigue.—The main purpose in the field studies was to complete the observations planned on the rythm problem, so that the greatest value might be obtained from previous investigations. In order to correlate accident and illness with fatigue, a summary of investigations made of the frequency and severity of both sickness and accidents, according to different types of work, was prepared. Measurements were also summarized as a basis of determining the relation of muscular tonus to fatigue. The material on rythm is voluminous and has been organized statistically for interpretation. As a result of these activities reports are in the process of preparation on the following subjects: (1) Industrial fatigue; (2) Rythm in industrial operations; (3) The effect of fatigue upon the quality of the work and spoiled work; and (4) Individual variation in working capacity. One comprehensive bulletin presenting fatigue in relation to working capacity has been published.⁸

II. Laboratory studies into the chemical phenomena of fatigue.—In the laboratory attention was given to the general problem of the chemical phenomena of fatigue. A summary of the major results thus far obtained is presented below.

a. Urinary sulphur: Tests were made of the sulphur output of men engaged in factory operations of varying degrees of arduousness and controlled by similar studies made on men at rest. The data obtained indicate that the rate of excretion of oxidized sulphur is greater in work than at rest, and bears a close relation to the severity of the work engaged in. This suggests a possible classification of operations with respect to their arduousness by quantitative chemical analyses of the urine of the operators.

b. Urinary phenol: Similar studies were made on the phenol output of men at work and at rest with the purpose of determining to what extent men were able to render harmless and eliminate these normally occurring toxic substances. The results of these analyses indicate that strenuous muscular effort increases the total amounts of these substances eliminated. Although the percentage detoxified by conjugation is not decreased, the amount excreted in the free or toxic state is increased. This increase may assume significant proportions in excessive effort.

c. Urinary hydrogen-ion concentration: The hydrogen-ion concentration of the urine was studied in order to follow its changes during

⁸ "Studies in Industrial Physiology." "Fatigue in Relation to Working Capacity." Public Health Bulletin No. 106, Feb., 1920.

rest and work. Results indicate that moderate work tends to increase slightly the hydrogen-ion concentration of the urine, and severe exercise to increase it markedly. A correlation has been noted between the physical strength of men, and the changes in the hydrogen-ion concentration of the urine, during the same amount of muscular effort.

d. Blood carbon dioxide: As another means of determining to what extent acidosis was developed during fatigue, the alkaline reserve of the blood, as measured by the carbon dioxide bound as bicarbonate of the plasma, was determined under various conditions of muscular effort. A decrease in the alkaline reserve proportional to the rate and amount of exercise was observed. The rate at which the alkaline reserve returned to its normal value was found to depend upon the length and severity of the exercise which had been indulged in.

e. Blood oxygen: The above study of the bound carbon dioxide of the blood in its relation to exercise led to a more extended study of the blood gases, particularly of oxygen. The results thus far obtained indicate that the increased oxygen requirement of the organism is capable of being met for a certain time, but that subsequently a decrease in the oxygen content, relative to the oxygen capacity of the blood, occurs. The extent to which the organism fails to meet its increased need for oxygen is perhaps of significance in fatigue.

f. Blood sugar: Because of the importance of carbo-hydrates as a source of energy in muscular effort, estimations of the concentration of sugar in the blood were made simultaneously with the above oxygen determinations. Results show that for a time the blood sugar is substantially unchanged but that continued muscular effort causes a progressive diminution in its concentration.

The results of the hydrogen-ion concentration of the urine and of the alkaline reserve of the blood appeared in the Public Health Reports.⁹ Reports of the other studies are now being prepared for publication.

III. INVESTIGATIONS OF WORKING CONDITIONS IN GOVERNMENT BUILDINGS.

On five occasions, upon request of the Post Office Department, investigations were conducted in post offices and divisions under its jurisdiction. Sanitary surveys were made of the Newark, N. J., post office, in the post-office section of the Grand Central Station, New York City, and in the Mail Equipment Shops, Washington, D. C., while an analysis was made of the efficiency of medical relief given in the Chicago post office, following a sanitary survey of the working conditions in the post-office building there.

A sanitary survey was made of the offices occupied by the Coast Guard and of a suite of offices on two floors of the Ford Building, occupancy of which was contemplated by a division of the Treasury Department.

An investigation was made upon request into an alleged insanitary condition in the congressional office building, and assistance rendered to the Department of Agriculture in the establishment of first-aid facilities in the Dye Research Laboratory of the Bureau of Chemis-

⁹ "Changes in Blood and Urine Resulting from Fatigue," Public Health Reports, Vol. 34, No. 31, Aug. 1, 1919, pp. 1682-1691.

try. Special occupational studies were conducted in the Brooklyn Navy Yard, and in the Bureau of Engraving and Printing, Washington, D. C.

Upon request of the Reclassification Commission, a special memorandum was prepared and submitted relative to medical and surgical relief needs of Government offices in Washington, D. C.

IV. MEDICAL AND SURGICAL RELIEF STATIONS FOR GOVERNMENTAL DEPARTMENTS.

At the request of the United States Employees' Compensation Commission, physicians have been placed at the following stations to give medical and surgical care for injuries received by civilian employees: Old Hickory Powder Plant, Jacksonville, Tenn.; Amatol Arsenal, Hammonton, N. J.; Curtis Bay General Ordnance Depot, South Baltimore, Md.; Muscle Shoals District, Ala., comprising United States Nitrate Plants Nos. 1 and 2, and the construction of the Wilson Dam; Morgan General Ordnance Depot, South Amboy, N. J.; General Ordnance Depot, Fort Wingate, New Mex.; Rock Island Arsenal, Rock Island, Ill., including Savanna Proving Grounds Station, Savanna, Ill.; Army Supply Base, Brooklyn, N. Y.; Army Reserve Depot, New Cumberland, Pa.; General Supply Depot, Jeffersonville, Ind.

An appreciable reduction in accident frequency and severity has been made as a consequence not only of recommendations to the commanding officer of each plant relative to prevalent occupational hazards, but also of periodical lectures, first-aid classes, instructions to the employees to report promptly all injuries, and the promulgation of general rules safe-guarding the health of the workers.

In some of the areas sanitary measures were imperatively needed, such as efficient collection and disposal of refuse and the elimination of breeding places for mosquitoes and removal of latrines. Due consideration was given to the occupational health hazards at the arsenals, such as the precautions to be taken in the handling of T. N. T. in loading shells; the handling of acid to prevent burns; preventive measures for the reduction of accidents by the installation of safety devices on machinery and conveyers, and the issuance of safety-first bulletins. At one of the larger plants absenteeism was very high on account of alleged sickness. This was controlled by the installation of an appropriate record system with the consequent decrease in absenteeism and a reduction in the cost of warehousing from \$4.25 to \$1.95 per ton. Special attention to record systems is now being planned, their value having been shown in the aid furnished in determining the effects of working conditions through absenteeism, sickness, and accidents occurring in different departments and plant processes.¹⁰

The preliminary organization of the emergency medical and surgical relief work of the War Risk Insurance was perfected prior to the close of the last fiscal year. On October 28, 1919, responsibility for the direction of the activities of the relief rooms of this bureau was transferred to the Hospital Division.

¹⁰ "Keeping Tab on Sickness in the Plant." Public Health Reports, Vol. 35, No. 15. Apr. 9, 1920, pp. 881-890.

V. CONSULTING SERVICE.

As a result of the research activities of this office during the last quarter of the preceding fiscal year and during this last year plant working conditions were summarized, reports prepared, and recommendations of a medical and engineering character made this fiscal year to 110 manufacturing establishments. These establishments include such diverse industries as metal refining, production of bakelite, pottery, sanitary ware, tile, tools, brass and gray metal castings, sheet lead, motors, machinery, steel, cable, munitions, asphalt paving materials, chemicals, flour, paper, cigars and tobacco, clothing, shoes, corsets, and other products. In addition consulting service has been given to approximately 125 State and municipal health and labor departments, industrial establishments, universities, and other groups interested in various phases of industrial hygiene and sanitation.

While many of the requests for assistance pertained to occupational diseases and industrial poisons, dusts, abnormal temperature and humidity, artificial illumination, cutting-oil dermatoses, and fatigue, yet there were many others of a diversified character, such as requests for assistance in organizing plant surgical and medical relief departments, recording systems for interpreting sickness, absenteeism, turnover and like factors involved in a study of the effects of plant working conditions, housing of industrial workers, building codes for second-class cities, methods for conducting plant surveys into working conditions, job analysis forms to assist employment managers in placing workers in suitable occupations, methods for the disposal of wastes, and bibliographies on various phases of industrial hygiene.

VI. MISCELLANEOUS.

A. LABORATORY ACTIVITIES.

Assistance has been rendered to this office by laboratories of various governmental departments and of certain educational institutions.

The Hygienic Laboratory has analyzed some of the samples collected by field investigators, including samples from the pottery survey, while the laboratory of the Bureau of Mines, Pittsburgh, Pa., has rendered very considerable assistance in making determinations of the lead content and dust count of glaze and dust samples collected from the potteries of the East Liverpool district. In like manner similar assistance has been rendered through one of the service officers stationed at the laboratory of hygiene of the University of Pennsylvania. The Bureau of Standards has made numerous analyses of cutting oils submitted to it in connection with the research of the occupational dermatoses from cutting oils. Similar service has been rendered by the laboratory of Columbia University of the city of New York in connection with certain specific occupational poisons found in the cross-sectional study of the industries of the New York Harbor, as well as in the foundry survey, and by the laboratory of the department of public health of the medical school at Yale University in connection with studies into air conditioning.

B. COOPERATION WITH BUREAU OF MINES.

The cooperative arrangement with the Bureau of Mines, whereby the service selected and placed acting assistant surgeons on mine cars, and assisted the bureau in certain problems coming within the sphere of industrial hygiene and sanitation, was continued by this office. In February, 1920, Passed Asst. Surg. R. R. Sayers was detailed by the service, on request of the Bureau of Mines, to take charge of these activities as chief surgeon of that bureau. The loan of the services of Scientific Asst. George E. McElroy has been continued, in order that his experience in certain dust and ventilation work might be available for studies, under Daniel Harrington, mining engineer, into these problems as they appear in metal mines. He has participated in dust and ventilation investigation in three large and three small mines.

A mass of information has been collected, which is now being interpreted, and joint industrial reports have been prepared and transmitted to the mines. Underground conditions were found in these studies to be such as to cause a high death rate from tuberculosis induced by silicosis, traceable to excessive air dustiness and inefficient ventilation. Concurrent improvements in the repair and relocation of fans, the use of water drilling and of sprays with dry drilling, with the consequent improvement in ventilation and reduction in air dustiness, have helped to improve mine working conditions.

PUBLIC HEALTH ORGANIZATION AND ADMINISTRATION.

SANITARY SURVEY OF SHREVEPORT, LA.

A sanitary survey of Shreveport, La., was made at the request of the State and municipal authorities by Epidemiologist F. E. Harrington in December, 1919. A report with recommendations was submitted covering the water supply, sewerage, garbage collection, vital statistics, communicable diseases, and food inspection of the city. A special report was made on the typhoid fever incidence in Shreveport, there having been recorded 47 cases of this disease in 11½ months. The water supply was found to be safe, but with an uncontrolled milk supply, an unsatisfactory privy system, the insanitary handling of foodstuffs, together with the great influx of possible carriers due to the oil-field rush, Shreveport might easily have had an extensive outbreak of typhoid fever.

SANITARY SURVEY OF CANTON, OHIO.

A sanitary survey of Canton, Ohio, was made in November, 1919, by Epidemiologist F. E. Harrington, and a report with recommendations was submitted to the State and local health authorities. It was recommended that the Hughes Act, passed by the State Legislature of Ohio, be adopted as a State standard and that the Department of Health be given the control and power to improve sanitary conditions in connection with scavenging of privies, the collection of garbage, and the establishment of an isolation hospital.

PUBLIC HEALTH ADMINISTRATION IN MONROE, N. C.

A sanitary survey of Monroe, Union County, N. C., was made in October, 1919, by Epidemiologist F. E. Harrington.

During the period of the survey a study was made of the municipal sewer system, municipal water-supply system, and general sanitary conditions. Available records of the registration of vital statistics of communicable diseases were studied and a house-to-house canvass conducted.

Among the recommendations made were those for the extension of the present sewer system and a uniform sanitary privy-disposal system, for the procuring of an extended water supply, and for the institution in Union County of the North Carolina cooperative plan for public-health activities.

SURVEY OF PUBLIC HEALTH ADMINISTRATION IN MEMPHIS, TENN.

Upon the request of the mayor of Memphis, Tenn., and the secretary of the State board of health, a survey of public-health administration and sanitary conditions in Memphis was made by Passed Asst. Surg. Paul Preble in April, 1920. The conditions responsible for the high morbidity and mortality rates and the unsatisfactory sanitary status appeared to be very largely the result of an unorganized health administration.

Detailed recommendations for the reorganization of the various divisions of the health department were submitted.

ALEXANDRIA COUNTY, VA.

At the request of the State and local health officers Associate Sanitary Engineer H. B. Hommon conferred with the officials of Alexandria County, Va., in January, 1920, and made recommendations regarding the installation of a sewerage system including a treatment plant and water-supply service for that county.

SURVEY OF ALLIANCE, OHIO.

In compliance with a request from the health officer of Alliance, Ohio, indorsed by the State health officer of Ohio, Scientific Assistant H. I. Huntington in August, 1919, made a survey of the dairy conditions in Alliance. A sudden outbreak of diphtheria which occurred in that city during the period of the survey was also investigated. Specific recommendations were furnished the municipal authorities.

PENNSYLVANIA.

A survey of sanitary organization and administration of the Pennsylvania State health department was conducted by Surg. Carroll Fox in May, 1920, at the request of the State health commissioner, and suggestions in regard to the reorganization of the department were made.

MUNICIPAL WASTE BULLETIN.

A bulletin ¹¹ on the character, collection, and disposal of municipal wastes, prepared by Associate Sanitary Engineer H. R. Crohurst,

¹¹ Public Health Bulletin No. 107.

is now in press. This article gives an account of present practice and opinion with regard to all classes of municipal wastes and will be of service to communities which are considering the establishment of disposal plants.

DETAILS TO STATES AND CITIES.

Upon the request of the governor of New Mexico, Passed Asst. Surg. C. E. Waller has acted as State health commissioner of New Mexico during the past year, and at the close of the year arrangements were made at the urgent request of Gov. Larrazola to have Dr. Waller continue as head of the health department for another year.

Associate Sanitary Engineer (R.) Leslie B. Frank continued to serve as city health officer in Dallas, Tex., conducting a study of intensive health administration.

Surg. (R.) F. E. Harrington, in January, 1920, was granted leave without pay for one year to act as city health officer of Minneapolis, Minn., at the request of the secretary of the board of health.

COOPERATION WITH JOHNS HOPKINS UNIVERSITY.

At the request of the Johns Hopkins University authorities Surg. W. H. Frost was detailed to take charge of the department of epidemiology in the Johns Hopkins School of Hygiene and Public Health during the past year. Dr. Frost has continued in general charge of the stream pollution studies and of the epidemiological influenza investigations being made by the service.

COOPERATION WITH INDIAN SERVICE.

Examinations of specimens and tests of a bacteriological nature to aid in the diagnosis of communicable diseases have been made at the service laboratories for physicians of the Indian Service. Anti-typhoid vaccine has been furnished through the Hygienic Laboratory to the Office of Indian Affairs on request.

COOPERATION WITH HAWAIIAN AUTHORITIES.

The service has cooperated with the Territorial board of health of Hawaii in the examination and medical and surgical care of patients in isolation at Kalihi.

COOPERATION WITH PORTO RICAN AUTHORITIES.

Cooperation with the Porto Rican authorities was continued, the chief quarantine officer for Porto Rico being detailed for duty with the Institute of Tropical Medicine and Hygiene of Porto Rico.

CHILD HYGIENE.

During the fiscal year the service has engaged in extensive studies and investigations of the health problems of infants and children under the direction of Asst. Surg. Gen. (R.) Taliaferro Clark. These have been carried on in seven States and in the District of

Columbia. Comprising, as they do, approximately 35 per cent of the population, supervision of the health of mothers and children constitute a public health problem which stands second to none in importance. In each State where the service has operated during the past year the work has been done in cooperation with the State health authorities, or else the project has received official indorsement. Requests for assistance in making studies and investigations of this character have been more numerous than the service could comply with, and the ability of the service to extend its operations during the year has been limited only by the size of available appropriations.

DRIED MILK POWDER AS A FOOD FOR INFANTS.

In August, 1919, the service began an investigation in the city of Boston in cooperation with the Boston Baby Hygiene Association, the Boston Health Department, and several other agencies, to determine the safety, usefulness, and comparative value of dried milk powder in infant feeding. The babies selected for this study are those entirely artificially fed, who are not more than 6 months old, and who are under the supervision of the Boston Baby Hygiene Association. The infants are not specially selected, but represent every type physically, and were recruited from all sorts and conditions of homes in order that the milk might be given a test under conditions which would be met with in general practice.

The total number of infants studied since August, 1919, is 287 as follows: Group I, 62; Group II, 178; Group III, 47.

The published results of Dried Milk Powder in Infant Feeding¹² for the first three months during which these investigations were carried on indicate (1) that the dried milk powders and their remade products, used in this study, are safe for infant feeding; (2) that the average gain per baby per day in Group I was 0.629 ounces; in Group II, 0.880 ounces; and in Group III, the average gain per baby per day was 0.713 ounces; (3) that the opinions expressed by the nurses strengthen the conclusions already drawn, viz. that reconstituted and reconstructed milks, of the brand employed, are safe and useful for infant feeding, and that in certain respects, particularly in the case of reconstituted milk, and in the cases of babies who digest natural milk badly, they may have points of distinct advantage.

Since the publication of this preliminary report the investigations have been continued and extended to include laboratory studies carried on in cooperation with the Harvard Medical School, comprising examinations of milk prepared in homes of different degrees of cleanliness; weekly examinations of intestinal flora of a selected number of babies from each group; careful physical examination of babies of all groups; and a comprehensive social study in connection with all groups. Studies in metabolism of 15 babies have been determined by Dr. Fritz Talbot of the research laboratory of the Massachusetts General Hospital. These studies will continue throughout the summer in order that the babies may be under observation during the period of one year and under varying climatic

¹²A Preliminary Report, Reprint No. 588 from P. H. R.

conditions. The studies thus far made unquestionably confirm the value of dried milk powder in infant feeding and suggest its use as a therapeutic measure in certain types of sickness.

HEALTH WORK IN SCHOOLS OF CECIL COUNTY, MD.

The ordnance plant at Perryville, Cecil County, Md., was transferred to the custody of the Public Health Service in March, 1919.

A medical officer was assigned at the beginning of the school year to exercise health supervision over the children attending school on this reservation.

On request of the State and local health and educational authorities this supervision was extended to include other schools of the county. During the period September 15, 1919, to May 27, 1920, 3,094 children were given physical examinations and 200 were tested mentally. Owing to the lack of time and limited personnel engaged in this work only those pupils were tested mentally whom the teachers or supervisors had found to be particularly backward.

In all, 73 schools were visited. The work comprised physical examinations, mental tests, and publicity work through the press, civic organizations, and individuals.

Health work in Perry Point School.—The Perry Point School being on a Government reservation and under the jurisdiction of the medical officer in charge of this station it was thought desirable to inaugurate a model system of school health supervision in this school, which consisted in—

1. Instructing the teachers.
2. Conducting modern health crusades.
3. Making monthly weighing and measuring of the pupils.
4. Establishing nutrition classes.
5. Instructing the children in general and personal hygiene through semimonthly talks.
6. Conducting community health activities.
7. Supplying school nurses.

In addition to the work which has been carried on under the above headings the children of this school were given the Schick test and immunized against diphtheria.

Results of the work.—Too short a time has elapsed since the completion of this work to give an accurate tabulation of the results. However, a questionnaire sent to the teachers of the county shows that over 200 corrections of hampering physical defects have been made. Reports indicate that the parents of between 500 and 600 other children will have their defects corrected during the summer vacation. In addition the community has employed a full-time public-health nurse whose services begin with the next school year. This is expected to serve as a starting point of a complete and up-to-date medical inspection service throughout the county.

COOPERATION WITH THE DELAWARE RECONSTRUCTION COMMISSION.

On request of the director of the Delaware Reconstruction Commission, a medical officer of the Public Health Service was assigned to this State in January, 1920, to cooperate with the commission in the study and investigation of child hygiene problems and to

assume direction of the medical activities of the commission. Prior to the assignment of this officer, 10 baby health centers had been established and were doing a limited amount of work. Since the arrival of the officer in the State three new centers have been operated in rural Delaware, the records of the reconstruction commission have been entirely revised, a digest of the laws of the State relating to children has been prepared, and articles on child health prepared by the director have appeared in practically every newspaper in the State.

The service officer has been appointed medical director of the State board of education. Approximately 5,000 school children have been examined by him since the date of his appointment.

The establishment of dental clinics in the schools of the State are referred to on page 48.

STUDIES IN MALNUTRITION OF SCHOOL CHILDREN, BALTIMORE, MD.

During the first semester of the 1919-20 scholastic year approximately 10,000 school children in selected districts in Baltimore, Md., were weighed and measured under the direction of Prof. E. V. McCollum, Johns Hopkins Medical School. Of this number approximately 1,500 were found to be 10 per cent or more underweight according to available standards. On request of Prof. McCollum the service undertook the physical examination of these underweight children for a dual purpose: (1) To select a representative number of children having one or more remediable defects in order to study the effect of these defects and their elimination on growth and development, and (2) to select a group of children whose state of malnutrition does not depend on physical defects, for medical and social follow-up work, in order to determine the value of such work in overcoming uncomplicated malnutrition. This latter study is being made under the direction of Prof. McCollum.

In January, 1920, the service commenced the physical examination of these underweight children, which continued for approximately two months. During this period 1,471 children were examined, and of this number 229 of them having from one to five remediable physical defects were selected for the purpose of determining the effect of the correction of these defects on growth and development.

The Johns Hopkins Hospital; Mercy Hospital; Maryland General Hospital; Presbyterian Eye, Ear, and Throat Hospital; Hebrew Hospital; Franklin Square Hospital; University of Maryland Hospital; and the Baltimore College of Dental Surgery are cooperating with the service and have extended facilities for these corrections.

To date 120 cases are under corrective treatment, and in all 50 corrections have been completed.

These studies are still under way, and it is too early to forecast the ultimate results.

CHILD HYGIENE INVESTIGATIONS IN THE STATE OF MISSOURI.

On request of the acting governor of Missouri and the State board of health an officer was assigned to this State in October, 1919, to assist in the organization of a division of child hygiene in the State

board of health and to cooperate with the State board of health in State-wide field investigations in child hygiene.

The scope of the work included: (1) Organizing a division of child hygiene in the State board of health. (2) Making field investigations, consisting of a house-to-house canvass in selected districts, for obtaining data as to sanitary conditions of the homes, the family income, milk supply, the physical and mental status of expectant mothers, and the health conditions of infants and children. (3) Studying the school hygiene problems, making height and weight measurements, attempting to secure the cooperation of parents in the correction of physical defects and in improving the nutrition of their children, securing physical examinations of children by local physicians in order to enlist their cooperation and insure permanency of the work. (4) Establishing at local expense health centers for prenatal, infant, and preschool care. (5) Establishing the work on a permanent basis by educating communities in the importance of the problem and influencing them to employ one or more public health nurses, school nurses, and organizing community health councils. (6) Bringing about better birth registration. (7) Educating the public by lectures, exhibits, distribution of literature, and newspaper feature articles. (8) Securing to the State board of health the active cooperation of the State volunteer organizations engaged in child health work.

The personnel engaged in this work was under direction of a commissioned medical officer and consisted of physicians, public-health nurses, school workers, and field investigators.

Results.—In 20 towns baby health centers are being or have been established and equipped, and funds appropriated for the employment of one or more permanent community nurses. School medical inspections have been made in 11 towns, and a total of 17,561 children were examined, among whom there were observed 34,823 physical defects, such as defects of vision, hearing, and dentition, nasal defects, enlarged tonsils, adenoids, and skin diseases.

Of 16,867 children examined in 9 communities, 3.7 per cent had defective vision in one eye, 1.2 per cent defective vision in both eyes, 2.3 per cent defective hearing in one ear, 2 per cent defective hearing in both ears, 53.4 per cent had carious teeth, 11.4 per cent adenoids, 38.2 per cent enlarged tonsils, 0.4 per cent active tuberculosis, 1.3 per cent trachoma, and 0.8 per cent defective speech.

In 18 towns clinics were held for the study of malnutrition. Of 4,076 underweight children who were examined at these clinics 26.6 per cent were mouth breathers, 38.4 per cent had defective tonsils, 12.6 per cent adenoids, 54.7 per cent defective teeth, 43.1 per cent appeared anemic, and 61.7 per cent assumed fatigue posture. Furthermore, of these children 17.4 per cent were excessive coffee users, 31.2 per cent consumed an inadequate amount of milk, and 15.8 per cent were excessive meat eaters.

In 1,100 underweight children in 18 schools of 8 towns in the State who attended the nutrition clinics for two or more months, 781, or 71 per cent, gained two or more pounds per month; in 92, or 9.4 per cent, the weight remained stationary; and 227, or 20.6 per cent, lost weight.

The following agencies have cooperated in this work: Missouri Tuberculosis Association, American Red Cross, Agricultural Extension Service of the University of Missouri, Parent Teachers' Association, Women's Christian Temperance Union, the medical and dental profession, and in a number of districts the superintendents of education and allied school authorities.

The investigations, as conducted in Missouri during the past year, have shown that definite and permanent results can be accomplished by the employment of proper methods.

FIELD INVESTIGATIONS IN MOUTH HYGIENE.

Studies made by medical officers of the service in previous years of the physical status of school children revealed the presence of dental defects in numbers far in excess of the combined total of all other physical defects encountered, and such lack of dental facilities for the children of the different communities surveyed that it was decided to make a special investigation of mouth hygiene problems during the fiscal year just ended. For this purpose a mobile dental unit was organized comprising a dental surgeon, an assistant for prophylactic work, a portable dental outfit, a moving-picture film dealing with mouth hygiene problems and a supply of toothbrushes and tooth paste generously donated by the American Red Cross.

MOUTH HYGIENE IN WEST VIRGINIA.

On request of the State health and educational authorities the unit was assigned to duty in the State of West Virginia where extensive investigations of the condition of the mouths of school children of this State were made during the period October, 1919-April, 1920. One of the primary objects of this work has been to assist in the establishment of school dental clinics in these communities, to be maintained at local expense.

The unit visited 43 different localities where the mouths of children were examined, moving-picture films projected, addresses were given and personal contact made with influential citizens and representative volunteer agencies which resulted in the establishment or the promise of the establishment of 14 school dental clinics, largely at county seats. The plan contemplated starting from the county seat as a base and extending dental facilities to the sadly neglected children of the more remote districts of the counties visited.

In the course of this work 7,059 children were examined, who presented a total of 16,151 unfilled carious teeth and 1,822 missing six-year molars, a condition of dental neglect which can be observed in many other average American communities.

MOUTH HYGIENE IN THE STATE OF DELAWARE.

On recommendation of the service officer assigned to child hygiene work in the State of Delaware, cooperating with the Delaware Reconstruction Commission, the mouth hygiene unit was assigned to this State from April 27, 1920, to the closing of the schools in

June. During this period, the unit visited 12 communities and examined 1,435 children, of which number 530 had malocclusion, 331 had more or less marked inflammation of the gums, 2,865 carious teeth, and 934 missing six-year molars were noted. These studies of the fate of the six-year molars point to very practical educational needs; namely, to inform parents that the six-year molars are not deciduous teeth, but the first of the permanent teeth to erupt, that they are the key of the dental arch, and that the premature loss of them results in irregular development of the dental arch and lessened ability properly to masticate food.

The work of the unit has attracted wide attention and requests for its services have been so numerous that several such units could be utilized with profit if funds for their maintenance were available.

MENTAL HYGIENE, JUVENILE COURT, DISTRICT OF COLUMBIA.

On request of the judge of the juvenile court of the District of Columbia, the service assigned two officers to make the physical and mental examinations of juvenile delinquents appearing before the court, for the purpose of (1) supplying the court with information relating to physical and mental status as an aid in properly disposing of these cases, and (2) investigating the relationship of physical and mental status to truancy and delinquency.

The District of Columbia Chapter of the American Red Cross has paid the salary of a psychiatric social worker for follow-up work and special investigations of home conditions.

Of 152 white males examined mentally, 2 were above normal, 54 normal, 30 retarded, 28 feeble-minded, 31 constitutional psychopathic inferior, 5 epileptic and of allied status, and 2 insane (dementia precox), and of these 11 were judged to be in need of institutional care.

Of 20 white females examined mentally, 3 were found to be normal, 7 mentally deficient, 10 constitutional psychopathic inferior, and 9 were judged to be in need of institutional care.

Of 187 colored males examined mentally, 1 was above normal, 62 normal, 33 retarded, 69 mentally deficient, 18 constitutional psychopathic inferior, 4 epileptic, and 33 were judged to be in need of institutional care.

Of 52 colored females subjected to mental examination, 17 were classified as normal, 9 retarded, 24 mentally deficient, 1 constitutional psychopathic inferior, 1 epileptic, and 16 were found to be in need of institutional care.

In every case where it was possible to do so routine Wassermann tests were made, 324 in all—259 males and 65 females. All of the 113 white males tested negative. Of 146 colored males tested, 5, or 3.4 per cent, were positive. Of 17 white females, 2, or 1.17 per cent, were positive, and of 48 colored females tested, 11, or 22.9 per cent, were positive.

In the course of the physical examinations a great variety of more or less important physical disorders and defects were found, many of which were subsequently treated at the various local clinics and hospitals.

Although these investigations have been conducted for a comparatively short time, they have clearly demonstrated the importance of the work from the standpoint of social prophylaxis.

A SURVEY OF DELINQUENCY, DEPENDENCY, AND FEEBLE-MINDEDNESS IN
THE STATE OF OREGON.

On request of the acting director of the extension division of the University of Oregon, and with the indorsement of the State board of health, a medical officer of the service was assigned to this State as director of a survey of delinquency, dependency, and feeble-mindedness.

The work of the survey is to ascertain the number of individuals who on account of either mental or physical abnormality have shown themselves as potential or actual social liabilities. There has been established what is believed to be the first State-wide cooperative movement in mental and social hygiene by the citizens of any State. A personal appeal in the name of the State and the request of the legislature was made to every citizen who by reason of his occupation or training was more or less in touch with the needs and defects of his own community. Special certificates were issued to these individuals, requesting them to act as special volunteer assistants to the State survey and to fill out and return to the director cards registering the medicosocial liabilities of the State.

The following figures show some of the activities of the survey up to June 30, 1920:

Preliminary letters sent out to individual citizens asking their cooperation for the State survey-----	12, 624
Certificates issued under the seal of the State requesting citizens to act as "special voluntary assistants"-----	10, 000
Survey cards upon which to record data (issued only on request of the special voluntary assistants and special field investigators)-----	44, 172
Special letters to Oregon editors concerning publicity for the survey----	450
Cards returned -----	3, 634
Analysis of these 3,634 cards shows the following:	
Children one or more years over age for grades, and who are therefore retarded in school work-----	2, 502
Of the 2,502 retarded children, the teachers record as showing symptoms of mental dulling or mental defect-----	649
Per cent of over-age grade pupils showing mental dulling or mental defect-----	25. 9
Of the 3,634 cards returned, including both retarded over-age grade children in schools and individuals in the community, there were recorded as mental defectives-----	1, 234
There were recorded as delinquents-----	446
There were recorded as dependents-----	798

Of these dependents, 87 were cripples considered subjects for relief under Senate bill No. 105 for crippled, dependent children.

Of these 87 dependent children, the outstanding causes of dependency were recorded as follows: Blindness, 10; deafness, 54; crippled limbs, 2; and mental defect, 21.

The above-mentioned figures are only part of the work of the survey, and must be considered in the nature of a progress report.

CHILD HYGIENE STUDIES IN GEORGIA.

A medical officer has been assigned to the State of Georgia to cooperate with the State board of health in organizing a division of

child hygiene and making State-wide studies and investigations of child health problems. This work was undertaken shortly before the close of the fiscal year.

NEUROPSYCHIATRIC RESEARCHES.

Researches in neurosurgery were undertaken during the past fiscal year under the direction of Passed Asst. Surg. W. L. Treadway, chief of the neuropsychiatric section of the Hospital Division.

A medical officer was detailed to the Polyclinic Hospital, New York City (United States Public Health Service Hospital No. 38) to undertake research studies in neurosurgery not only of importance in connection with the medical relief of discharged soldiers, sailors, and marines, but also capable of developing information and neurosurgical technique which may be applied to ordinary trauma of the brain, spinal cord, and peripheral nerve injuries, due to general and industrial accidents. Furthermore, it is believed information and surgical technique gained in connection with the treatment of war wounds may be applied to the treatment of neoplasms, vascular lesions, and affections of the cords, brain, and membranes.

The program for researches in neurosurgery takes into account the most obvious investigations that refer directly to the care and treatment of the discharged soldier, sailor, and marine. During the present fiscal year, it is expected that the work will be developed along the following lines:

1. Sample studies of aftercare, in hospitals and in communities, of neurosurgical conditions acquired or aggravated while in military service.
2. The investigation and study of surgical and secondary procedure in neurosurgical cases with special reference to obtaining data on promoting recovery with maximum improvement.
3. The historical correlation and compilation of data relating to neurosurgery, and determination of the best methods of operative procedure in neurosurgery.
4. Standardization of measures for the evaluation of function as applying to neurological conditions.
5. The elaboration of therapy in the chronic and diseased conditions of nervous cases.

RURAL SANITATION.

The amounts appropriated for the special studies of and demonstration work in rural sanitation of the United States Public Health Service in the last several fiscal years have been as follows:

1917-----	\$25,000
1918-----	150,000
1919-----	150,000
1920-----	50,000

In the calendar years 1914, 1915, and 1916 sanitary surveys of typical rural counties in different sections of the country were conducted by the United States Public Health Service in cooperation with State and local authorities. The Government expenses for

these surveys were met mainly with funds allotted from appropriations to the Public Health Service for "Field investigations." Eighteen counties in sixteen States—Northern, Eastern, Southern, and Western—were surveyed. The findings and the results from these surveys are presented in Public Health Bulletin No. 94. Among the results were the determination of improved methods for the correction of insanitary conditions and the formulation of standard procedure in health work for rural communities. Among the conclusions were (1) that at less than 2 per cent of the rural homes in the United States are the most essential principles of sanitation consistently in practice, (2) that for less than 3 per cent of our rural population is local health service approaching adequacy provided, (3) that sustained efficient whole-time local health service is essential to the establishment and maintenance of reasonably good sanitary conditions in our rural districts, and (4) that duly efficient personnel for rural health work generally can not be expected without active participation in the work by central agencies, such as official State and National health agencies, to prevent adverse influence of local politics.

Since 1916 the rural sanitation funds of the Public Health Service have been used almost entirely for cooperative demonstration work. In the active period of the war this work was conducted mainly in areas immediately around military camps and critically important war industries. The work in these areas served to protect the military forces and the civilian population and also to accomplish demonstrations in high-grade rural sanitation, the latter being the primary purpose for which the appropriations were granted.

With the termination of the active period of the war an enlargement of the program of cooperative rural health work as an activity of the Federal health agency to stimulate nation-wide work to make up the losses in vital capital caused by and coincident with the war appeared, in view of the demonstrated effectiveness of the plan proposed, to be definitely and clearly advisable. The estimate of appropriation approved by the Bureau of the Public Health Service and the Treasury Department and submitted to Congress for special studies of and demonstration work in rural sanitation in the fiscal year 1920 was \$500,000. Congress granted only \$50,000.

WORK IN THE FISCAL YEAR 1920.

On account of the reduction in the appropriation the work in a considerable number of areas in which it was yielding excellent results had to be discontinued. Numerous requests from communities, counties, and States in different parts of the country for cooperation from the Public Health Service in the demonstration of methods of rural health work had to be declined. The amount to be appropriated by Congress for this work could not be anticipated and the \$50,000 was not made available until about the middle of July, 1919. Thus the fiscal year had begun before contracts for the work during the fiscal year 1920 could be made. Notwithstanding such handicap, satisfactory odds from State and local sources for the financial support of the cooperative projects were obtained.

On July 1, 1919, about \$9,000 unexpended under previous contracts remained available. This amount, along with the \$50,000 ap-

propriated, made \$59,000 available for the cooperative rural health work of the Public Health Service in the fiscal year 1920. Of this sum \$45,360.72 has been expended under allotments for cooperative projects in counties and about \$12,000 has been expended for administration and supervision of the concrete activities and for general studies of the problem of rural sanitation.

During the fiscal year cooperative projects have been carried out in 31 counties in 11 States. To meet the expenses of this cooperative work a total of \$175,093.88 was furnished and expended from community, county, and State governmental sources and \$54,011.47 from civic sources such as local health associations and Red Cross chapters and the International Health Board. Thus, this investment of Federal funds has been met with odds of about 5 to 1, which indicates unmistakably that such investment of Federal funds stimulates to a significant degree State, county, and municipal governments to invest in the business of rural health promotion.

The scope and the results of the work and the funds expended from the different sources are presented in the following tabular statement:

Compilation of data on cooperative demonstration work in rural sanitation in the fiscal year 1920.

	Countries.										
	Charleston, S. C.	Cherokee, Kans.	Cumber- land, N. C.	Edge- combe, N. C.	Glynn, Ga.	Greene, Mo.	Hamilton, Tenn.	Harrison, Miss.	Jasper, Mo.	Lauder- dale, Ala.	Madison, Ala.
	July 1	July 1	Aug. 1	July 1	July 1	Jan. 1	Jan. 1	July 1	July 1	Aug. 1	July 1
Work started (1919).....											
Expenditures:											
(a) Rural sanitation funds (P. H. S.).....	\$4,263.37	\$856.91	\$1,830.46	\$1,562.50	\$2,105.99	\$250.44	\$1,108.33	\$1,200.00	\$2,074.51	\$275.00	\$3,338.10
(b) State.....	125.00	1,319.85	1,436.25	1,500.00	13,160.38	4,192.43	2,826.20	5,210.00	2,082.70	2,900.00	5,668.00
(c) County.....	12,165.66	5,001.15	5,912.50	3,000.00	3,200.00	4,442.01			4,573.00	5,266.24	2,587.23
(d) Other agencies.....	2,999.96	1,832.05	820.00								
Total.....	9,553.99	9,009.96	10,019.21	6,062.50	18,526.37	8,884.88	3,934.53	6,410.00	8,737.24	8,441.24	11,593.33
Number of lectures.....	42	35	43	33	55	212		83	113	54	7
Attendance at lectures.....	3,000	4,700	6,605	1,433	3,819	8,292		10,283	6,363	2,257	1,333
Pieces of literature distributed.....	2,500	19,118	7,395	3,185	2,907	11,966		2,207	16,522	4,871	2,561
Sanitary inspections:											
(1) Private homes.....	200	1,649	2,651	912	30,174	20	4,475	9,925	3,778	6,658	17,313
(2) Schools.....	31	220	65		48	58	50	41	129	161	46
(3) Churches.....	2	2	16		8		16	16	8		
(4) Stores, markets, etc.....	50	535	1,576		5,938	43	130	2,477	108	2,723	145
Total.....	283	2,406	4,308	912	36,168	121	4,671	12,459	4,023	9,542	17,504
Special inspections:											
Food product places.....	102	481	1,638	180	2,454	11	75	58	460	1,092	474
Physical examination of school children:											
(1) Number examined.....	327	2,040	4,929	1,237	1,501	6,593		1,003	3,723	6,477	3,756
(2) Number found defective.....	213	1,873	535	469	1,907	5,398		795	2,915	3,249	1,420
Public health nursing:											
(1) Number of visits to cases com- municable diseases.....	21	1,391	10,952	489	394	111		77	1,991	452	72
(2) Number of talks given groups of persons.....	475	41	46	263	61	10		6	237		
(3) Number of visits to give prenatal care.....		45	140	52	18	19		4	154	47	2
(4) Number of visits to explain and demonstrate infant hygiene.....		291	267	126	17	441	24		1,483	165	366
Laboratory examinations:											
Positive.....	17	35	297	17	158			321	2	552	582
Negative.....	82		366	59	628		1	435	1	804	1,667

Immunization:											
(1) Number of complete antityphoid inoculations.....	4	39	552	877	2,513	59	.....	52	423	965	636
(2) Number of complete antismalproxi inoculations.....	.....	.....	6,861	2,776	705	34	1,037	330	535	3,686	16
(3) Number of complete antipneumonia inoculations.....	(2)	(3)	8	(4)	(2)	(4)	(2)	(2)	(3)	(2)	(2)
Antimalaria work.....	.....	.....	10	2	225	.....	.....	380	.....	14	2
Number of persons treated for removal of hookworm infection.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Veneral-disease prevention:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
(1) Number of prophylactic treatments.....	.....	.....	1,109	.....	2	1,065	.....	170	1,687	5,333	4,367
(2) Number of curative treatments.....	.....	.....	.....	.....	40	.....	.....	.....	.....	.....	.....
Number of visits by health officer or his assistant:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
(1) To diagnose suspected cases of infectious disease.....	4	46	401	.....	86	20	89	55	22	383	396
(2) To impose quarantine measures.....	11	60	139	131	23	30	72	62	.....	188	224
Number of cases quarantined.....	6	2,436	170	191	23	39	72	140	.....	301	190
Sanitary privies installed:											
L. R. S.....	80	.....	277	10	686	.....	.....	.....	79	10	101
Concrete vaults.....	.....	113	174	8	.....	.....	.....	.....	82	.....	.....
Bucket and box.....	.....	223	68	4	.....	.....	.....	.....	52	107	107
Pits.....	.....	229	172	517	.....	.....	.....	85	50	48	31
Total.....	80	565	691	539	686	.....	211	85	263	165	239
Number of new sewer connections.....											
Number of new water connections.....	.....	61	56	40	136	.....	1	108	209	300	118
Number of wells improved.....	.....	23	64	.....	.....	.....	.....	90	90	59	.....
Number of springs improved.....	10	95	21	.....	8	.....	.....	.....	31	16	16
Number of public milk supplies radically improved.....	.....	6	.....	.....	.....	.....	.....	.....	1	6	.....
.....	4	13	5	.....	13	.....	.....	.....	22	3	3

¹ County health department with reasonably adequate whole-time personnel maintained entirely with county funds since April, 1920.

² Considerable.

³ None.

⁴ Little.

Compilation of data on cooperative demonstration work in rural sanitation in the fiscal year 1920—Continued.

	Counties.								Total.
	Mason, Ky.	Muskogee, Ga.	Ottawa, Okla.	Talladega, Ala.	Walker, Ala.	Walker, Ga.	Arlington, Va.	Wake and Durham, N. C.	11 Virginia counties. ^a
Work started.....	July 1	Aug. 1	July 1	July 1	July 1	Nov. 1	Aug. 1	July 1	July 1
Expenditures:									
(a) Rural sanitation funds (P. H. S.).....	\$2,151.67	\$275.00	\$3,612.76	\$1,999.15	\$1,696.87	\$800.00	\$275.00	\$2,021.26	\$13,663.37
(b) State.....	5,587.11	.....	.....	312.50	.....	.....	2,000.00	.....	18,253.85
(c) County.....	.....	18,217.83	3,988.91	6,351.41	4,100.00	1,901.80	3,050.00	44,038.00	10,815.35
(d) Other agencies.....	375.00	18,217.83	2,486.44	2,551.71	1,400.00	.....	3,200.00	.....	144,539.32
Total.....	8,113.78	36,710.66	10,088.11	11,214.77	7,196.87	2,701.80	8,525.00	46,059.26	42,732.57
Number of lectures.....	78	10	33	20	49	61	64	.....	191
Attendance at lectures.....	5,102	357	(1)	1,537	2,245	3,802	4,480	.....	18,000
Pieces of literature distributed.....	1,645	11,285	3,322	6,161	3,565	3,911	2,224	.....	83,068
Sanitary inspections:									
(1) Private homes.....	1,103	47,610	2,645	571	1,282	3,284	3,472	.....	12,373
(2) Schools.....	126	31	25	32	54	54	321	.....	1,492
(3) Churches.....	.....	.....	2	21	4	.....	10	.....	105
(4) Stores, markets, etc.....	16	2,369	371	72	190	83	50	.....	16,876
Total.....	1,245	50,010	3,043	696	1,530	3,421	3,853	.....	168,568
Special inspections:									
Food-product places.....	8	234	35	221	78	46	18	.....	7,665
Physical examination of school children:									
(1) Number examined.....	2,408	1,376	1,593	1,964	3,559	770	2,063	.....	45,019
(2) Number found defective.....	1,939	1,099	738	1,094	2,675	562	81,750	.....	27,631
Public health nursing:									
(1) Number of visits to cases communicable diseases.....	323	286	733	705	772	.....	153	.....	18,872
(2) Number of talks given groups of persons.....	90	17	80	121	121	.....	941	.....	2,462
(3) Number of visits to give prenatal care.....	18	73	47	8	43	.....	.....	.....	2,670
(4) Number of visits to explain and demonstrate infant hygiene.....	87	1,964	125	38	44	.....	.....	.....	5,428
Laboratory examinations:									
Positive.....	170	585	.....	438	124	4	70	.....	3,372
Negative.....	211	1,223	.....	1,340	251	5	305	.....	7,438

Immunization:									
(1) Number of complete antityphoid inoculations.....	33	1,131	275	529	1,208	57	.....	.....	9,353
(2) Number of complete antismallpox inoculations.....	10	17	12	77	2,360	780	.....	.....	19,370
(3) Number of complete antipneumonia inoculations.....			23	7	(1)	(3)	(4)	(2)	38
Antimalaria work.....									
Number of persons treated for removal of hookworm infection.....	24	108		7	39		29		840
Veneral-disease prevention:									
(1) Number of prophylactic treatments.....	2	115	10	18					147
(2) Number of curative treatments.....	41	2,503	414	4,329					21,086
Number of visits by health officer or his assistant:									
(1) To diagnose suspected cases of infectious disease.....	69	51	46	314	122	59	56		2,219
(2) To impose quarantine measures.....	42	11	54	149	73	31	168		1,468
Number of cases quarantined.....	43	117	138	74	124	31	56		4,151
Sanitary privies installed:									
L. R. S.....	29	4		63	2	55		233	1,631
Concrete vaults.....		33						151	613
Bucket and box.....		744	2,965	730	2,139		1,846	1,722	10,864
Pits.....				19	10	10		1,971	3,142
Total.....	29	781	2,965	812	2,151	65	1,846	4,077	16,250
Number of new sewer connections.....									
Number of new water connections.....	11	172	153	173	16	126	97	61	1,538
Number of wells improved.....	20	85	90	170	17	2	25		1,755
Number of springs improved.....					49	8	20	135	409
Number of public milk supplies radically improved.....		2		3	2			14	34
		431							494

⁵ See text, p. 58.⁶ See text, p. 59.⁷ No estimate.⁸ 275 treatments known to have been induced outside of clinics.

PLAN OF WORK.

In every instance the cooperation of the Public Health Service is extended only in response to formal requests from the proper governmental authorities of the county and from the State health department. A preliminary survey of the situation is made by a representative of the State health department or a representative of the Public Health Service, or both. From the data obtained in the preliminary survey the general plan of work to be carried out and the amount of funds necessary to secure the definite results desired are agreed to by the several agencies to cooperate in the project.

The working force in the average demonstration county consists of a whole-time county health officer, a whole-time sanitary inspector, and a whole-time health nurse. The health officer and the other members of the working force are appointed by the proper county authorities, but they must be acceptable to all of the cooperating agencies. The only ground upon which the interests of all the co-operating agencies can meet is that of fitness of the personnel to render efficient services. The county health officer is given a status of field agent in the Public Health Service, and also, as a rule, a status of deputy State health officer. Thus his position is an example of common-sense coordination of the administrative features of the activities of the properly constituted local, State, and National governmental health agencies.

The different phases of health work indicated in the county are taken up in what appears to be the logical and most advantageous sequence. Every salient phase of health work—including safeguarding of water and food supplies, sanitary excreta disposal, fly control, antimalarial measures, infant hygiene, school inspection, antituberculosis and antivenereal disease measures, industrial hygiene, etc.—is carried out in the demonstration units. Thus the work is comprehensive and it can be adjusted for advantageous cooperation from the various and sundry governmental and extra-governmental health agencies which have been created for one reason or another.

The plans of work carried out in Wake and Durham Counties, N. C., and in the group of 11 counties in Virginia differed somewhat from that carried out in the other counties presented in the tabular statement in that the activities were concentrated especially upon measures for furnishing clean water supplies and sanitary disposal of human excreta.

DEMONSTRATION IN WAKE AND DURHAM COUNTIES, N. C.

The demonstration work in rural sanitation in Wake and Durham Counties, begun in the fiscal year 1919 with an allotment of \$10,000 from the rural sanitation fund of the Public Health Service and a special appropriation of \$5,000 made by each of the two counties, was continued in the fiscal year 1920, from July 1, 1919, to November 1, 1919. The funds available for the special project in the fiscal year 1920 were \$2,144.41 from the Public Health Service and about \$5,000 from the counties, along with about \$45,000 of county funds appropriated for general health activities.

Large returns were obtained on the investment for the cooperative rural sanitation work in these two counties. The advancement of

sanitary improvements was remarkably rapid and extensive. In a large proportion of the closely built-up areas public water supplies of good quality were instituted to take the place of polluted private supplies, and sewerage systems were installed with the abolishment of hundreds of insanitary privies. In the strictly rural areas over 2,000 privies of sanitary type were installed, either to replace privies of grossly insanitary type or to provide sanitary conveniences at homes at which no privies previously had existed. Milk and other food supplies were safeguarded by the installation of pasteurizing plants and by general sanitary measures. Over \$400,000 was expended by local property owners for sanitary improvements, including (1) \$104,000 for water supplies, (2) \$213,700 for installation or extension of sewerage systems, (3) \$41,990 for installation of sanitary privies, (4) \$1,100 for installation of septic tanks, (5) \$28,000 for pasteurizers and other improved equipment at dairies, (6) \$5,406 for screening, washing machines, and other improved equipment at eating establishments, and (7) \$14,400 for ditching and oiling to prevent breeding of potential malaria-carrying mosquitoes.

As a result of the sanitary improvements there was a wholesome reduction in the local prevalence of many of the communicable diseases. In Durham County 214 cases of and 31 deaths from typhoid fever were reported in the calendar year 1918, as against only 70 cases with 5 deaths in the period January 1 to October 1, 1919.

In the fiscal year 1920 Wake County established a county health department with whole-time personnel, appropriating for its support \$21,500, and Durham County increased its annual appropriation for its whole-time health department \$12,538 to \$22,538.

COOPERATIVE DEMONSTRATION WORK IN 11 VIRGINIA COUNTIES.

Besides the cooperation in Arlington County, indicated in the tabular statement, page 56, a special plan of cooperative demonstration work in rural sanitation was carried out in the following 11 counties in Virginia: (1) Alleghany, (2) Bath, (3) Chesterfield, (4) Greensville, (5) Henry, (6) Lunenburg, (7) Mecklenburg, (8) Orange, (9) Rockbridge, (10) Roanoke, and (11) Warren. This plan was formulated with a view to accomplishing on the most economical basis possible the most important phases of sanitation in counties unable or (at the beginning) unwilling to expend much for health service.

In January, 1919, the State Board of Health of Virginia formally requested the Public Health Service to allot \$15,000 from its rural sanitation fund to meet a sum of at least equal amount to be allotted from the State board of health appropriations so as to provide a combined fund of at least \$30,000 for the project. The preliminary work was begun in February, 1919, when Passed Asst. Surg. W. F. Draper was detailed to Virginia to cooperate with the State board of health and the State council of national defense to assist in inaugurating and supervising the activities in different parts of the State. The first few months were spent in negotiating with the authorities and interested citizens of various counties and in conducting a series of public meetings in different parts of the State to explain the purpose and the importance of increased health work in Virginia. Little of the detailed work in the counties was performed

before July 1, 1919. It was expected that the authorities of counties generally would be reluctant to appropriate county money to enter into the cooperative health project, but soon after the negotiations were begun it was discovered, with surprise, and, because of the popular interest indicated, with gratification that every county to which the proposition had been presented was offering to participate, and the requests from counties for the cooperation soon exceeded the limits of the combined fund from State and National Government sources.

Each of the 11 counties furnished \$1,000 to support the cooperative work. The county fund was met with \$500 from the State board of health and 500 from the Public Health Service, making a budget of \$2,000 for the conduct of the work in each county for one year. With this budget, a man trained in the fundamental principles of health work was engaged as sanitary demonstrator at a salary of \$100 a month and automobile transportation was provided. The phases of work concentrated upon were those which appeared to promise the most in health protection from the amount of work and money to be expended. They included especially sanitary disposal of human excreta, protection of drinking-water supplies against dangerous contamination, and (to a less extent) control of mosquito-breeding.

The duties of the sanitary demonstrator were as follows:

1. Make sanitary surveys of incorporated towns and villages in the county and recommend the adoption and enforcement of such sanitary ordinances as might be needed, arouse popular interest to support the sanitary work, and give all possible assistance to town councils and to individual citizens in carrying out the detailed measures for sanitary improvements.

2. Inaugurate measures to provide sanitary toilets and a safe water supply at every school in the county, assist in securing funds for same, and supervise the construction work, to see that it would be carried to a successful conclusion.

3. Do all possible by educational measures, persuasion and technical assistance to secure as far as possible, at individual homes throughout the county the installation and proper maintenance and use of sanitary toilets and safe water supplies.

4. Create popular interest and sentiment for public health work so that the citizens would be definitely concerned to have a duly comprehensive and adequate county health service, or at least continue on the same scale the following year.

An officer of the Public Health Service, with special training in rural health work, was assigned to supervise the cooperative work in each group of four counties. The duties of the supervising officer were to plan and direct the work of the county sanitary demonstrators, help them in their problems, appear before town councils and county authorities and public meetings, in matters relating to the work and, through his knowledge and experience, stimulate popular cooperation for the success of the demonstration.

The results of this work are very encouraging. In each of the counties in which the work has been conducted for as long as 10 months a large proportion of the homes (ranging from 300 to 2,500) has made radical sanitary improvements. In the average county the prevalence of filth-borne infections has been markedly reduced. As

an indication that the results have been convincing is the fact that all of these counties with one exception have agreed to increase their appropriations from county sources for county health work in the coming year from 50 to 500 per cent. Furthermore a number of counties within the general vicinity of the demonstration counties are now inaugurating, entirely or largely at county expense, more or less adequate county health services.

That this cooperative demonstration work in rural sanitation has stimulated State-wide public interest for public health organization and development in the rural districts of Virginia, is indicated by the increasing appropriations from year to year shown in the following

Appropriations for rural sanitation.

Year.	State.	Counties.	Total.	Year.	State.	Counties.	Total.
1916.....	\$7,200	\$7,200	\$14,400	1919.....	\$17,500	\$17,500	\$35,000
1917.....	7,200	7,200	14,400	1920.....	30,000	70,000	100,000
1918.....	10,000	10,000	20,000				

ADMINISTRATION.

The work was conducted under the administrative direction of the Division of Scientific Research in the Bureau of the Public Health Service. Surg. L. L. Lumsden, with headquarters at the rural sanitation office in Washington, D. C., had charge of the field activities. Passed Asst. Surg. W. F. Draper, with headquarters in the State board of health office at Richmond, Va., had immediate supervision over the cooperative projects in Virginia. Passed Asst. Surg. K. E. Miller, with headquarters in the State board of health office at Raleigh, N. C., had immediate charge of the cooperative projects in North Carolina and South Carolina, and during the fiscal year was given by the State board of health direction of all county health work in North Carolina in which the State board was a participant. Asst. Surg. Thomas Parran, jr., with headquarters at Joplin, Mo., had immediate supervision over the cooperative projects in Missouri, Oklahoma, and Kansas. Associate Epidemiologist W. K. Sharp, jr., with headquarters in the State board of health office at Montgomery, Ala., had immediate supervision over the cooperative projects in Alabama, Mississippi, and Kentucky. Associate Epidemiologist C. C. Applewhite, with headquarters in the State board of health office at Atlanta, Ga., had immediate supervision over the cooperative projects in Georgia and Tennessee. These field directors, besides making frequent inspections of the work and advising with field agents in their respective jurisdictions, made general studies of the problem of rural sanitation and assisted State health departments in stimulating the development of efficient whole-time health service in rural counties and townships.

RESULTS.

Every one of the cooperative projects in the fiscal year 1920 yielded results exceeding in value by many fold the cost in labor and money. Among the total results indicated in the tabular statement, to which especial consideration may be given, are:

1. Public-health lectures presenting the principles and details of sanitation to over 83,000 persons.

2. Over 150,000 sanitary inspections of private homes, with plain discussion of the findings being made in almost all instances with members of the households.

3. Physical examination of over 45,000 school children, with notification of parents causing the institution of corrective measures among a very considerable proportion of the 27,631 children who were found to have more or less incapacitating physical defects.

4. Eighteen thousand eight hundred and seventy-two visits by health nurses to homes of cases of communicable disease to advise and show the afflicted households how to prevent the spread of the infections.

5. Six hundred and seventy visits by health nurses to advise with and assist expectant mothers in carrying out hygienic and physiological measures making for healthy mothers and healthy babies.

6. Five thousand four hundred and twenty-eight home visits by health nurses to demonstrate hygienic measures for the protection of the health and lives of infants.

7. Nineteen thousand three hundred and seventy persons vaccinated for protection against smallpox, a disease which now should be obsolete and which can be made so by thorough vaccination.

8. Twenty-one thousand two hundred and three treatments to rid persons of venereal disease infection and prevent spread of the infection.

9. One thousand four hundred and sixty-eight cases of dangerous communicable disease quarantined to prevent spread of infection in the community, the state, and throughout the country.

10. The installation of 16,250 sanitary privies at homes previously provided with grossly insanitary privies or without toilets of any sort.

11. One thousand one hundred and seventy-eight homes provided with clean water supplies in place of contaminated water supplies.

12. Radical improvement of 494 public milk supplies distributed in considerable proportion through the channels of interstate commerce to prevent the spread through the enriching medium of milk such infections as those of typhoid fever, scarlet fever, diphtheria, tuberculosis, septic sore throat, and infant diarrhea.

The value to the community of measures which result in the changing of a child from a cripple to a healthy-bodied, healthy-minded being and the value to a mother of the life of her baby can not be estimated in dollars and cents; but the monetary value to a community of a marked lowering of sickness rate with a corresponding increase in wage earning may be estimated roughly. The cooperative projects generally if considered only from a monetary standpoint have been locally and nationally successful.

Among the demonstration units in which remarkable reduction in sickness and death rates has followed the sanitary improvements accomplished is Madison County, Ala. In this county, with a population of 50,000, the cooperative work was begun in the latter part of the calendar year 1917. The reduction in deaths for the year 1919, as compared with 1915, 1916, and 1917, which appeared definitely to result from the sanitary improvements accomplished, amounted to a saving in that year of over 150 human lives. The total cost of

the health work in that county—met with funds from local, State, and National governmental sources—was for each of the calendar years 1918 and 1919 about \$10,000. The saving of the lives of American citizens at a per capita cost of \$66 seems a reasonably good investment.

Among the States to which the Public Health Service has extended its cooperation in rural health work, and in which progress in State-wide development of rural health work has been especially good, may be mentioned Virginia, Alabama, Georgia, and North Carolina. The progress in Virginia is indicated in a previous section of this report, page 59.

Alabama, having in 1915 only one county provided with a whole-time health department with a whole-time county health officer at its head, now has 16 counties, comprising over one-fourth of the rural population of the State, provided with county health departments, each having at its head a whole-time county health officer.

In Georgia, at the beginning of the fiscal year 1920, nine counties has whole-time health departments, with appropriations from county sources aggregating \$43,400. In the course of the fiscal year 8 additional counties established whole-time county health departments, making a total of 17 with appropriations from county sources aggregating over \$95,400, and 8 other counties, in which activities are to be begun as soon as properly qualified personnel to fill the positions of county health officers can be found, made appropriations and otherwise complied with the requirements of the State law relating to the establishment of whole-time county health departments.

In North Carolina, in the fiscal year 1920, eight counties were added to the list of counties maintaining in financial cooperation with the State board of health whole-time county health departments, making a total of 21 such counties in that State with budgets for health work increased from an aggregate of \$101,400 for 1919 to \$183,200 for 1920. In addition to these cooperative counties four counties in North Carolina are maintaining, entirely at their own expense, whole-time health departments.

CONCLUSION.

Reasonably adequate appropriations for the cooperative activities of the United States Public Health Service in rural health work could be used with a high degree of effectiveness, and in entire consistence with our principles of government, for nation-wide promotion of human health and would yield to the national welfare a dividend second to no other obtainable from investment of Federal funds.

STATISTICAL OFFICE.

The necessity for a statistical office which might serve to assist in promoting the statistical and epidemiological studies which constitute such an important part of public health investigations has been recognized for some years, but it was not until the winter of 1918-19 that the organization of such an office could be undertaken. At that time it was necessary to assemble a statistical force for compiling and analyzing the extensive morbidity and mortality statistics collected in field investigations of influenza. The force which was then assembled, under the direction of Surg. W. H. Frost and Asso-

ciate Statistician Edgar Sydenstricker, was organized with a view to the ultimate development from it of a statistical office with the personnel and equipment necessary for general statistical work. As the earlier phases of the influenza studies were completed, the work of the statistical office along other lines has been developed, and since the detachment of Surg. Frost, in October, 1919, the office has been placed under the direction of Statistician Edgar Sydenstricker.

The purposes for which the office was established are:

- (1) To provide a central plant, with experienced personnel and necessary mechanical equipment, for the tabulation of material collected in previous studies and reports of disease prevalence.
- (2) To furnish, in connection with many other lines of service activities, the technical advice required in planning their statistical work and in the analyses of the results of such work.
- (3) To conduct certain statistical studies independently but closely coordinated with other field and epidemiological studies carried on by the Public Health Service.

A brief statement follows of the activities of the statistical office in the year 1919-20 along several lines.

STUDIES OF MORBIDITY REPORTS.

The completeness and accuracy of morbidity reports depend in large measure upon the forms which health departments require to be filled out by physicians and others in reporting cases of notifiable diseases. These forms differ widely in the different States and municipalities and the results vary even more widely. It has been deemed of sufficient importance to inaugurate a study of a number of existing forms from the point of view of their practical usefulness as indicated by actual results. Various samples of morbidity reports are being subjected to statistical analysis. This study naturally has three phases: (1) The arrangement of the report card or form from the point of view of convenience in use by the reporting physician and by health departments; (2) what items of information are essential from the point of view of the health department and the vital statistician and the practicability of including such items on the report forms from the point of view of the physician; (3) the statistical use of the various data actually afforded by reports in use. This study is being carried on partly in conjunction with the tabulation of morbidity reports of certain diseases of which other studies are being made and partly on an independent basis. It is being done in cooperation with the Division of Sanitary Reports and Statistics and with several State and municipal health departments.

STATISTICAL STUDIES OF PULMONARY TUBERCULOSIS.

The purpose of these studies which were begun during the present calendar year were (1) to compile from already published material, and to collect and tabulate from original morbidity reports, data relating to the incidence of tubercular infections, acute and arrested morbidity, and mortality among persons of different sexes and ages,

race stock, occupation, and geographic location; and (2) to analyze and present the collected data in such a way as to make them available for students of the disease and to aid in defining the fields in which intensive field studies might be made most profitably. The work is being done in connection with certain other studies of tuberculosis in progress, in cooperation with the Division of Sanitary Reports and Statistics.

INDUSTRIAL MORBIDITY STATISTICS.

A report of the field work on the collection and tabulation of reports of disease prevalence among wage earners in certain industrial establishments will be found on page 202.

STATISTICAL STUDIES IN COOPERATION WITH OTHER OFFICES AND DIVISIONS.

EPIDEMIC INFUENZA.

The statistical office has, under the general direction of Surg. W. H. Frost and the immediate supervision of the statistician in charge, continued certain statistical studies of influenza. More specific reference to these studies and to publications of their results is made elsewhere under the title "Statistical and epidemiological studies of influenza." In connection with influenza studies various methods of correcting 1918 population estimates to take into account the absence of males of military age have been published in a paper entitled "Difficulties in computing civil death rates for 1918, with especial reference to epidemic influenza." (Public Health Reports, vol. 35, No. 7, Feb. 13, 1920.)

VENEREAL DISEASES.

In cooperation with the Division of Venereal Diseases, and with personnel detailed from that division to the statistical office, a study is in progress of the venereal-disease case reports made to a number of State health departments by physicians and clinics. From these studies it is hoped to throw light on the relative incidence of venereal diseases among persons of different colors, sexes, ages, and occupations, and on the sources of and conditions under which infections occur, as well as to determine the statistical value of various items of information required in case reports from physicians. The results of the first series of tabulations for a limited number of cases in cantonment zones were presented in a brief paper by Asst. Surg. Gen. C. C. Pierce to the annual conference of State and Territorial health officers with the Surgeon General. In addition to these studies a tabulation is under way of a large number of questionnaires relating to sex education in high schools.

CHILD HYGIENE.

In cooperation with field investigations of child hygiene, Asst. Surg. Gen. (R.) Taliaferro Clark in charge, the tabulation and analysis were begun of the results of a large number of physical and

mental examinations of school children. The statistical work is under the immediate direction of Asst. Statistician Selwyn Collins, of field investigations of child hygiene.

Assistance was also rendered by the statistician in charge in planning the forms for certain field surveys and records in Missouri of child and school hygiene and of the economic and sanitary conditions affecting the households of the children under observation.

PELLAGRA.

Certain phases of the statistical work of field investigations of pellagra were continued. Among these was a preliminary tabulation and analysis of the records which had been obtained in 1917 of seasonal variations in food supplies in relation to pellagra incidence in certain textile villages in South Carolina.

FATIGUE.

With the assistance of Associate Statistician W. I. King the tabulation and analysis of records of hourly production of women workers in certain factories in Wisconsin were completed.

MISCELLANEOUS.

From time to time upon request assistance has been given other field offices and other divisions along statistical lines, as, for example, the organization of a statistical section in the Marine Hospital Division, the compilation and presentation of current statistics of influenza during the epidemic of 1920, and suggestions and advice as to the planning of forms and methods and analyses of statistical results in other field offices of the service.

STREAM-POLLUTION INVESTIGATIONS.

The program of stream-pollution investigations inaugurated by the service in 1913 and discontinued in 1917, during the period of the war emergency, was resumed during the summer of 1919. Prior to 1917 studies relating to the sewage pollution of streams were conducted by three coordinated but separate organizations, namely, studies of the biochemistry and treatment of sewage and industrial wastes under the direction of Prof. E. B. Phelps, with field headquarters at Cincinnati, Ohio; studies of the pollution of coastal waters, with special reference to the contamination of oyster beds, under the direction of Surg. H. S. Cumming; and a study of the Ohio river under the direction of Surg. W. H. Frost, with headquarters at Cincinnati, Ohio. In reorganizing this work studies of the biochemistry and treatment of sewage and industrial wastes have been consolidated with the Ohio River investigation and other general studies of stream pollution. To date it has not been possible to resume investigations of the pollution of coastal waters.

During the summer and autumn of 1919 such of the original personnel of these organizations as was still available was assembled at Cincinnati, where the work was reorganized under the immediate direction of Passed Asst. Surg. Paul Preble and Associate Sanitary

Engineer H. B. Hommon, in charge, respectively of stream-pollution studies in general and of studies relating to the disposal of industrial wastes. Surg. W. H. Frost, stationed at Baltimore, Md., on other duty, was assigned in general supervisory charge. In this reorganization the work has been coordinated with that of the committee on sewage disposal of the National Research Council, Dr. Frost having been appointed as the Public Health Service representative on that committee.

The work undertaken during the year has comprised: Completion of a number of reports which were necessarily left uncompleted when active work was discontinued in 1917; refitting of the Cincinnati laboratory which had been partially dismantled; the organization of new work to be continued into the ensuing year; and a number of special investigations which, though not within the scope of the stream pollution investigations program, have from time to time been assigned to various of the officers attached to the stream pollution laboratory.

NATURE AND SCOPE OF NEW WORK.

The new work initiated during the year for continuance during the ensuing year, has been organized in three main divisions, coordinated under one general direction, but each under the immediate direction of a sanitary engineer, who is responsible for its execution in detail, namely:

(1) *Laboratory studies of fundamental factors in stream pollution and natural purification*; Associate Sanitary Engineer R. E. Tarett in charge, Cincinnati.

This is a continuation of work started in connection with the study of the Ohio River, and comprises chiefly laboratory studies upon the effect of various plankton forms upon bacterial death rates, and studies designed to improve and simplify the bacteriological methods developed during the Ohio River investigation. Owing to interruption of laboratory work incident to remodeling and refitting the Cincinnati station, and to the detachment of Sanitary Bacteriologist C. T. Butterfield for a period of six months for work in connection with influenza investigations, this part of the program has been but little developed as yet.

To this division of the work have been added a number of minor miscellaneous studies which can be most conveniently undertaken from Cincinnati. Among these has been a preliminary survey of the Mahoning River sanitary district in Ohio, undertaken with a view to possible cooperation of the service in a thorough study of stream pollution problems in that district. Upon completion of the survey it was found impracticable, for the present, to undertake the detailed study originally contemplated; but arrangements were made with the State departments of health of Pennsylvania and Ohio to cooperate with them in a more limited study of certain special problems relating to the purification of water supplies taken from the Beaver River and its tributaries, including the Mahoning.

Further work also in progress and projected for the ensuing year is the compilation of special data for several reports supplementary to the general report on the Ohio River investigations; the chief of such reports now in progress of compilation relates to the compara-

tive study of water purification processes in the Cincinnati and Louisville municipal filtration plants by Associate Sanitary Engineer H. W. Streeter.

(2) *Study of Chicago Drainage Canal and the Illinois River*; Associate Sanitary Engineer J. K. Hoskins in charge, temporary headquarters, Chicago, Ill.

The study of the Ohio River from 1914 to 1917 resulted in establishing, for that stream, certain quite definite quantitative relations between the pollution of the stream as measured by bacteriological and chemical standards and the basic factors involved, namely: Sewered population, industrial wastes, volume and rapidity of stream flow, and prevailing temperature. One of the main objectives in the program of stream pollution studies is to establish similar fundamental relationships which may be applied to studying and remedying stream pollution conditions in general, thus greatly simplifying and improving the methods at present applicable; therefore, the next step toward this objective is to repeat upon other streams the observations made upon the Ohio River, in order to test, and if necessary to modify, the conclusions drawn from the Ohio River study.

With this end in view it was proposed to the authorities of the Chicago sanitary district and to the Illinois State department of health by the Surgeon General that with their cooperation the service undertake a thorough study of the Chicago Drainage Canal and the Illinois River, with special reference to the fundamental factors concerned in pollution of these waters and their natural purification. To this proposal the authorities of the sanitary district and the State department of health heartily agreed, making available to the service all data collected by them in recent and current studies. Accordingly, near the close of the fiscal year Associate Sanitary Engineer J. K. Hoskins was assigned to organize and begin this study.

For the present, work in this connection is confined to collecting and compiling the basic data available from the sanitary district of Chicago, office of district engineer, United States Army, and other sources, and to making such supplementary field surveys as may be necessary to supplement the hydrometric and sanitary data available from these sources. These data as collected by Mr. Hoskins and two engineering assistants, with the help of the Chicago sanitary district, are being transferred to Cincinnati for compilation. During the spring of 1921 four or five laboratories will be established at convenient points upon the drainage canal and the Illinois River for chemical, bacteriological, and biological studies of samples collected systematically from various points in the drainage canal and streams, this phase of the work to be continued for not less than a full year. Considering the conditions existing in the drainage canal, the special opportunities afforded for study of natural purification in the Illinois River, and the availability from the Chicago sanitary district of the results of their extensive investigations covering many years, this study promises results of great importance at relatively small expense.

(3) *Studies of the biochemistry and treatment of sewage and industrial wastes*; Associate Sanitary Engineer H. B. Hommon in charge, Cincinnati.

During recent years a large part of the work in this phase of stream-pollution investigations has been directed toward the development of special processes for the treatment of various kinds of industrial wastes and the development of improved analytical methods. The main work begun during the past fiscal year, and to be continued into the next year, is a careful survey of some 15 large sewage-disposal plants of varying design in actual operation in cities of the Central, Eastern, and Southern States. This study, which is being carried out under the supervision of Associate Sanitary Engineer H. B. Hommon, by Associate Sanitary Engineer H. H. Wagenhals, Sanitary Chemist E. J. Theriault, and Sanitary Chemist M. J. Blew, includes at each plant, a careful physical survey of the plant, a survey of the sources of domestic and industrial sewage pollution, and analysis of the combined wastes and effluent. The purpose of the study is to furnish strictly comparable data relative to the efficiency of these plants and the cost of operation. It is believed that this survey, which will extend through the summer and autumn of 1920, will afford information of real practical value to the sanitary engineering profession.

MISCELLANEOUS WORK.

In addition to the above work, all of which is a part of the program of stream pollution investigations, the personnel of the Cincinnati laboratory have been detailed by the Surgeon General from time to time for a number of special investigations in connection with the activities of the service in other fields.

(1) *Influenza investigations.*—In connection with field investigations of influenza Passed Asst. Surg. Paul Preble was detailed from January 31 to March 28 to compile data previously collected, and prepare a report upon the sick relief and preventive measures carried out at a number of American cities during the influenza epidemic of 1918. Associate Sanitary Engineer H. H. Wagenhals was detailed from March 7 to April 9 to duty in Baltimore, Md., to supervise a special influenza survey in that city. Sanitary Bacteriologist C. T. Butterfield was assigned from January 27 to June 15 to cooperate with Prof. W. B. Wherry at the University of Cincinnati Medical School in laboratory studies of influenza.

(2) *Investigations of water supplies of interstate carriers.*—Associate Sanitary Engineer H. H. Wagenhals was assigned from August 13 for about four months to make a survey of and report upon sources of water supply used by interstate carriers in the State of Iowa in cooperation with the State department of health. In connection with the work of the Cincinnati laboratory Associate Sanitary Engineer R. E. Tarbett was directed to make a special study of the water supplies of steamers touching at Cincinnati.

(3) *Sanitary survey of Memphis.*—Passed Asst. Surg. Paul Preble was detailed from March 23 to April 20, upon request of the city authorities of Memphis and the State board of health of Tennessee, to make a detailed survey of public health activities in Memphis¹³ and to make recommendations for a reorganization of the city health department.

¹³ See p. 42.

(4) *Special surveys.*—Associate Sanitary Engineer J. K. Hoskins was detailed October 30 to November 10, 1919, to make a survey of Cedar Keys, Fla., with reference to a contemplated establishment of a leprosarium, and to make an investigation of the water supply of Miami, Fla. On October 13, Associate Sanitary Engineer R. E. Tarbett was detailed by the Surgeon General to make a study and recommendations relative to the water supply of the Public Health Service Hospital at Dansville, N. Y.

In addition to the above-mentioned special details, the sanitary engineers at Cincinnati have been called upon by the bureau from time to time to prepare a considerable number of memoranda in reply to current correspondence regarding matters requiring expert opinion of sanitary engineers.

Reports prepared.—Special reports relating to stream pollution investigations completed prior to 1917 were published from the Cincinnati laboratory during the fiscal year. A full report upon the Ohio River investigation, embodying the results of hydrometric and sanitary surveys and of extensive chemical bacteriological and biological studies made during the years 1914 to 1917, has been prepared and will be submitted for publication in the near future. A bulletin on the industrial waste pollution of the Ohio River and its tributaries has been prepared as a supplement to the general Ohio River report.

EXCRETA DISPOSAL STUDIES.

The board appointed to study the problem of sanitary disposal of human excreta in unsewered communities has continued its studies at Wilmington, N. C., Chicago, Ill., and Newport News, Va. In addition, inspection trips have been made to study installation of privies and methods of sewage disposal in the following States: Illinois, Indiana, Iowa, Kentucky, Massachusetts, Minnesota, Missouri, New York, North Carolina, South Carolina, and Virginia.

The board has had the cooperation of the United States Bureau of Entomology, which has detailed Mr. Max Kisliuk, jr., to study the insects involved, and of the United States Bureau of Plant Industry, which has detailed Professor Piper as consultant in agricultural phases of the subject.

TYPES OF PRIVIES.

From the studies made during the year it appears that little hope can be entertained for developing a privy which is either perfect or one which is best under all circumstances. The type to be selected is dependent upon local conditions of finance, intelligence, soil, and labor. The L. R. S., the chemical, the pail, the vault, and the pit systems all have their place according to local conditions, and without a study of these conditions all types are likely to give dissatisfaction. For instance, the chemical system is more suited to house owners than to unsupervised tenants; the L. R. S. effluent pipes are more likely to become clogged if placed directly in the soil than in a cinder or a stone bed; the pit is less unsatisfactory in localities with low than with high ground water.

SAWDUST-BARREL PRIVY.

What is apparently a new type of privy has been developed for use in localities where sawdust is plentiful. The construction, maintenance, and cleaning are simple and inexpensive; in its experimental stage it has been found to be as satisfactory and as unobjectionable as the L. R. S., the chemical, the pail, and the vault, is more economical than any of these, and is as satisfactory as and less objectionable than the pit. So far as can be judged, it is ready for the final practical test by the public. Experimental study indicates this new type is practical for any locality which has a readily available supply of sawdust and proper containers such as hogsheads and barrels, or suitable substitutes therefor. It is described in the report of the Board on Excreta Disposal given in the Transactions of the 18th Annual Conference of State and Territorial Health Officers with the U. S. Public Health Service, which will soon be published as a Service bulletin.

THE PRIVY AS A FLYTRAP.

It is exceedingly doubtful whether the fly-tight privy is ever maintained fly-tight for more than a few days. The logical conclusion would, therefore, seem to be to turn this liability into an asset by utilizing the privy as a flytrap. The disputed point whether flies enter by the privy ventilator (or flue) has been definitely settled experimentally and it has been found that up to 97.7 per cent of the flies which go down the flue are females obviously seeking a place to deposit their eggs. A flytrap has been devised which—in place of a screen—can be inserted into the flue and by catching the gravid females can be used to decrease materially the reproduction of flies.

FINAL DISPOSAL OF PRIVY CONTENTS.

Studies in chemical disinfection in bulk have not proved so satisfactory as was hoped, owing chiefly to the high price of chemicals and the high price, the scarcity, and the difficulty of retaining labor. Studies in drying excreta by the drum-drying method have given positive results from a study point of view but negative results from the viewpoint of practical administration, since the expense is prohibitive for the small towns which come into consideration. Incineration is feasible under certain at present somewhat restricted conditions. Pasteurization by waste steam is *sub judice*. At the time of writing, disposal into a sewer or burial by one technique or another, or treatment by septic tank, furnish the best outlook.

TRENCH BURIAL VERSUS SAWDUST COMPOSTING.

Burial in trenches still has certain objections, namely, the cost of labor, the removal—or the failure to utilize to its full protective value—of the top soil with its content of bacteria and protozoa, the fact that this method brings the excreta closer to the ground water, and the fly problem. To meet at least some of these objections a method of composting excreta with sawdust on top of the soil has been developed, and in the experimental studies thus far this has been found to present certain advantages, namely, it is inoffensive, it saves the labor of digging trenches, it utilizes to the fullest capacity the protective value of the top soil, and while it does not

prevent the development of the fly infection existing in the night soil, it prevents—if properly carried out—further fly blowing. The method is applicable only in places where sawdust is available without prohibitive expense for hauling. Experiments are under way to compost above ground with top soil.

BIRDS AS FLY DESTROYERS.

The important point has developed that birds, especially sparrows and mocking birds, devour a very large number of the flies which issue from the sawdust compose piles, and that in order to encourage this it is wise to select as place for burial or composting of excreta a field provided with trees or shrubs in which the birds may seek refuge.

DANGER OF GROUND WATER POLLUTION.

Sanitary regulations frequently emphasize the importance of the distance of a privy from the well or the water edge. Without minimizing this factor, when all other things are equal, experiments with pits and trenches indicate quite clearly that not sufficient importance has been attached to the element of moisture in the soil. In a thoroughly dry soil it is difficult or impossible for bacteria, protozoa, and nematodes to spread; a moist or a saturated soil may contain these organisms in large numbers, and they can spread actively and passively. In fact, the board has demonstrated experimentally that it is possible to maintain a pit privy for four months within 6 feet of four wells without any resulting bacterial pollution of the wells; but it has also demonstrated that fecal bacterial pollution can occur in three days 60 inches below a pit (in sandy soil) when flood conditions are simulated by running water into the pit; furthermore, a demonstration has been made of fecal bacterial pollution in wells up to a distance of 160 feet—beyond which no test has yet been made—when fecal material is placed in a pit the bottom of which reaches the top of the ground water level. Thus it appears that the water content of the voids in the soil is a matter of prime importance in considering the location of privies or of burial trenches, and that, given equal conditions as to this water content and of direction of flow of ground water, the factors of time and distance come into serious consideration. Experiments are in progress to confirm these findings.

ADMINISTRATION VERSUS INSTALLATION.

Inspection of various localities where privy-building campaigns have been conducted clearly indicate that local administrative offices do not always retain an enduring interest in the administrative side of privy sanitation as represented by proper inspection and scavenging. Experience demonstrates the conclusion that privy sanitation can give anticipated results in only exceptional instances unless there is more than the present average cooperation from State boards of health in the line of (1) instruction of local health officers, (2) supervisory inspection, (3) support of local health officers against pressure of local politics, and (4) instruction of local inspectors and scavengers.

COOPERATION WITH THE BUREAU OF CHEMISTRY.

As in the previous fiscal year, Surg. M. V. Glover has been detailed to the Bureau of Chemistry, Department of Agriculture, in connection with the enforcement of the Sherley amendment to the food and drugs act of 1906.

LEPROSY INVESTIGATION STATION.

In no time in the history of the segregation of lepers in the Hawaiian Islands, extending over half a century, have there been so many voluntary surrenders as during the past year or two. This is in striking contrast to the almost universal custom in the past of enforcing the segregation laws through direct arrest by deputy sheriffs.

The old prejudice on the part of lepers against segregation and their disbelief in any remedial measures on their behalf has been slowly but surely overcome during the past few years through various agencies. The erection of new and comfortable buildings in a greatly enlarged compound was a step in the right direction; the old horror of the "Federal doctors" when the work of the leprosy investigation station began gradually gave way before the tactful administrations of the successive medical officers of the Public Health Service in the past, until to-day the medical attendant enjoys the implicit confidence and hearty cooperation of his patients. Then, too, the constantly increasing number released on parole, apparently cured, scattered throughout the islands in addition to the publicity given the station's efforts by the Hawaiian and other newspapers have been a powerful aid and stimulus to the work.

In the summer of 1919 it was deemed expedient to adopt a standard system of treatment for all patients admitted to Kalihi Hospital. This treatment now consists of weekly intramuscular injections of the ethyl esters from the mixed fatty acids of chaulmoogra oil combined with 2 per cent iodine and the oral administration three times per day of the mixed fatty acids of chaulmoogra oil combined with $2\frac{1}{2}$ per cent of iodine. All patients not on special experiments are given the treatment here indicated.

The mixed ethyl esters used in this standard treatment can be prepared in sufficient quantities for large numbers of patients without very great difficulty. The preparation of sufficient material for oral administration is laborious and consumes large quantities of chaulmoogra oil. Because of the apparent relative inefficiency of oral administration of chaulmoogra oil compared with intramuscular injections, it appears not unlikely that the injections would prove a sufficient treatment, thus greatly reducing the cost and making it possible to treat larger numbers of patients. In order to test out the necessity for the use of capsules a group of 10 patients have been receiving the standard treatment minus the fatty acids taken by way of the mouth. It is not yet possible to give final results, but the indications at the present time are that these patients are doing substantially as well as those on the full standard treatment.

The chemical research work in chaulmoogra oil is being carried on in the laboratory of the University of Hawaii under the direction of President Dean. The laboratory continues to furnish chaulmoogra oil derivatives for therapeutic use at the service hospital. The work-

ing hypothesis was proposed in the last annual report which postulated "that the therapeutic action of chaulmoogra oil is due to the specific effect of the optically active fatty acids of the chaulmoogric acid series which constitute a unique type of fatty acids." Two acids of this series were isolated by Power and his collaborators and were named chaulmoogric and hydnocarpic acids.

In order to test this hypothesis it became necessary to prepare chaulmoogric and hydnocarpic acids in sufficient quantities for the treatment of two groups of patients. The greater part of the research work in the college laboratory has been directed to the development of methods by which these acids could be prepared in a state of purity in sufficiently large quantities. The final procedure involves the saponification of the oil and the fractional distillation of the fatty acids under a vacuum of about 1 to 2 millimeters. This is followed by the repeated crystallization of the fractions from alcohol and petroleum ether and the redistillation of certain fractions. The work is made particularly difficult because of the exceeding variability of the chaulmoogra oil, which is received by the station in different shipments. From some lots it is possible to recover only very small quantities of hydnocarpic acid and that only after laborious manipulation. From other lots this acid is recovered in relatively large quantities with comparative ease.

This work has now reached the stage where it has been possible to place two groups of patients of five each on treatments with the ethyl esters of the pure chaulmoogric acid and pure hydnocarpic acid, respectively. If these patients improve in a manner comparable to those who are receiving the standard treatment, we shall feel justified in drawing the conclusion that the two acids of this type which are known are specific in their clinical action in leprosy. It is hoped that it will be possible either to find and isolate other acids of this series or to make them artificially. The peculiarity of these acids is the five-carbon ring and the asymmetric structure of the molecule. It is conceivable that if the side chain can be reduced to one or two carbon atoms, we shall have fatty acids which are soluble in water and perhaps of much greater bactericidal action on the bacillus of leprosy. This is the line along which it is hoped that the chemical research can make some progress in the coming year.

In a number of lepers the lesions are found restricted to a few resistant nodules, a condition which is particularly common in the lobes of the ears. We have experimented with the local injection of various chaulmoogra oil derivatives into these resistant nodules. Where the quantity administered is at all large the common result is a very marked swelling, followed within two or three days by a breaking down of the tissue and more or less copious and prolonged pus discharge. The microscope reveals large numbers of leprosy bacilli, more or less disintegrated in these discharges. They ordinarily heal in about 10 days, although in some cases a longer time is required. After the reaction has entirely subsided the nodules are almost invariably found considerably reduced and softened. In each individual case there arises the question whether this method of treating a resistant nodule is or is not better than its surgical removal.

Since July 1, 1919, there have been released on parol by the board of health as no longer a menace to the public health, 31 patients in

whom it is believed the disease is absolutely arrested. Not one of the 50 patients paroled from this station since the inauguration of the use of the Dean derivatives, about two years ago, has shown any sign of relapse.

HYGIENIC LABORATORY.

Surg. George W. McCoy continued as director of the laboratory, and Surg. A. M. Stimson as assistant director.

The laboratory work has been carried out along the same general lines as in preceding years. There were two noteworthy developments during the year. The first was the erection of the new South Building, part of which is being used at the end of the fiscal year.

The second item of special interest was the inauguration of researches in tuberculosis. Plans for carrying on these studies have been made after consultation with many of the best workers in the country in this field. Difficulty has been experienced in getting the personnel required, but a start has been made and studies that will require a number of years to carry to completion have been begun.

DIVISION OF PATHOLOGY AND BACTERIOLOGY.

The work of this division continues to shift each year more largely to the control of biologic products and investigations related thereto, with the result that other research problems must often be given less attention than they merit. As supervision of the purity and potency of serums and other agents coming under the law of July 1, 1902, is one of the most important functions for which the service is responsible it is felt that every interest requires the very best handling of the problems coming under the biologics law that it is possible to render.

Since the policy has been adopted of recommending original license for biologic products only when there is evidence of value, in cases where it is possible to secure this, much of the work of the laboratory has been concerned with tests of agents of alleged therapeutic or prophylactic value.

Biologics (routine examinations).—The following tabulation shows the number of biologic products examined in the laboratory for the fiscal year:

	For purity.	For potency.
Diphtheria antitoxin.....	86	84
Tetanus antitoxin.....	31	31
Antipneumococcic serum.....	235	902
Antimeningococcic serum.....	193	394
Antidysenteric serum.....	37	113
Miscellaneous sera.....	67	.....
Tuberculins.....	68	.....
Rabies vaccine.....	115	.....
Vaccine virus.....	84	61
Pollen extract.....	17	.....
Miscellaneous vaccines.....	834	.....
Lipo vaccines.....	6	.....
Diphtheria toxin-antitoxin mixture.....	4	6
Typhoid vaccine.....	.....	107
	1,827	1,698

Grand total, 3,525.

Tuberculosis research.—In connection with the hospital treatment of discharged soldiers, it became advisable to undertake researches in tuberculosis at the Hygienic Laboratory and at certain service hospitals. Steps have been taken (1) to secure the best counsel as to the best problems to take up, (2) to obtain the services of expert personnel, and (3) to select the most advantageous places for the researches. Before the end of the fiscal year a good beginning had been made and a part of the program as laid down was under way.

This program called for researches in three general categories—chemotherapeutic studies, specific immunity studies, and studies of the relation between nutrition and tuberculosis. These were all to be carried on both in the laboratory and in the hospitals. Of the three categories enumerated, the first two are already represented by researches which are actively being prosecuted, but the third is still in abeyance pending the selection of suitable personnel.

The chemotherapeutic researches are further reported under the heading "Division of Pharmacology," page 82.

Meningitis research.—This work consisted of two main parts: First, studies of grouping of the meningococci based on serum reactions, and second, of attempts to improve methods for testing the potency of commercial serums. The studies in grouping were a continuance of those begun in the previous year and resulted in placing the grouping of a large number of strains of American meningococci on a satisfactory basis. The selection of representative strains for the manufacture and testing of commercial antimeningococcus serums was of great practical importance and these cultures have been distributed to all manufacturers in the United States. In grouping the cultures the results of the absorption of agglutinin and complement fixation tests were found to correspond closely, while a different system of grouping was indicated as the result of the tropin tests. The broad distinctions hitherto established between the meningococci and the parameningococci, however, were in general maintained by all the groupings.

The methods of testing commercial antimeningococcus serums have been further standardized and both the complement fixation test and agglutination test have been applied to each lot of serum intended to be offered for sale by the manufacturers and defective lots rejected. These tests are made at this laboratory as well as by the manufacturers.

Experiments to determine the best methods of preparing antigens for these tests have been closely correlated with this work.

The ability of antimeningococcus serums to protect mice against the living or dead organisms has been studied and the protective value of these serums as demonstrated by other workers was confirmed. However, it was not possible to make the test sufficiently quantitative for practical use.

Other studies demonstrated that rabbits could be immunized as readily against killed meningococci, by a strain belonging to one group as by another. The effects of freezing and thawing upon the antibody content of antimeningococcus serum and the fermentation reaction and pigment production of certain meningococci were also studied. Hygienic Laboratory Bulletin No. 124, now in press, contains the results of these studies.

Pneumonia studies.—The work on pneumonia has been directed chiefly toward the determination of the efficiency of prophylactic agents in use and enhancing the protective value of these. The investigations have followed two lines—purely laboratory research and field investigations.

At the laboratory in New York City Special Expert Russell L. Cecil and a group of investigators working under his direction have endeavored to reduce the toxicity of vaccines so as to permit the use of larger doses of the immunizing material.

At the Hygienic Laboratory efforts have been centered on devising a workable method for determining the potency of pneumococcus vaccines, but the results do not justify the establishment of a standard potency. Further work has confirmed the earlier impression that the saline suspension of pneumococci has better immunizing properties than the oil suspension, i. e., the so-called lipovaccines.

Field investigations have continued in the shape of observation of vaccinated groups and control (nonvaccinated) groups at State institutions, with the purpose of determining the practical value of the prophylactic agents available. It is now possible to say that apparently some protection is afforded by vaccines, although it is not as great as earlier reports from military and other sources led us to believe it would be. The duration is uncertain; apparently it does not run beyond a few months.

Influenza.—The recurrence of influenza early in 1920 gave an opportunity for continued work along this line. Infection experiments on man were attempted with cultures of Pfeiffer's bacillus, but these resulted negatively with respect to production of influenza.

A large number of cultural determinations were carried out on patients in Washington and vicinity, but without definite results.

Neither our own work nor that carried on at other laboratories has seemed to elucidate many of the puzzling features of this important disease.

Standardization of botulinus antitoxin.—A method for standardizing and testing botulism antitoxins A and B has been developed, which is similar to that used for tetanus and diphtheria antitoxins. The occurrence of a number of epidemics with a high percentage of fatalities, due to the consumption of ripe olives contaminated with *Bacillus botulinus* has led to attempts to produce antitoxic sera for treatment of such cases. It has not been shown that treatment with antitoxin is of value after severe symptoms have developed except in a few cases, but since the use of serum is the only specific treatment available, it is probable that it will be made use of to a certain extent and that it may be found to be of definite value if used in the early stages of the disease.

The potency of the serums submitted for test has varied greatly ranging from 2 units to about 450 units per cubic centimeter. In general the type A antitoxins which thus far would have been the antitoxins applicable for use in most of the food-poisoning cases have been of low potency, varying from 2 to 50 units per cubic centimeter. Some of the type B antitoxins, the type which is believed by some workers to be concerned in forage poisoning of horses and cattle have shown over 400 units per cubic centimeter. The results obtained with several "polyvalent" antitoxins tested indicate that it

is difficult to produce antitoxins which are effective against both types of toxin, as one type or the other has been in preponderance though the horses immunized received equal amounts of both toxins.

Antianthrax serum.—The standardization of this preparation has been taken up, and, while a foundation had already been laid by others for a protection test, the procedure could scarcely be said to have been on a workable basis. As a result of experiments which have been carried out largely at this laboratory, it is believed that it will be possible to distribute for standardization purposes dried spores of the anthrax bacillus and a test serum which would give the minimum of protection which might reasonably be expected in the commercial product.

Antistreptococcic serum.—The situation from the point of view of control of this serum is most unsatisfactory. The lack of accord between different workers as to the grouping of the streptococci and the difficulty of immunizing animals make the problem an exceptionally troublesome one. A start has been made by tentatively adopting what appears to be a workable immunological grouping of the organisms and on the basis of this endeavoring to raise the quality of commercial serums as judged by protective tests on mice. This work is to be carried on until it become possible to place this serum on about the same basis, in regard to testing, as is the antipneumococcic serum, or until it appears that efforts to do so are fruitless.

Antidysenteric serum.—Foreign and American workers have recently established the production of both endotoxin and exotoxin by the Shiga type of the dysentery bacillus. This has served as a starting point for standardization studies along the lines that have proved so effective in connection with diphtheria antitoxin, tetanus antitoxin; perfringens antitoxin and botulinus antitoxin. This work is but partially completed, but the present indications are that it will be possible to provide a standard for antidysenteric serum during this coming year. The therapeutic value of this serum seems to be well established.

Deer-fly fever.—Laboratory studies have been carried on in connection with the investigation of deer-fly fever, which is being conducted in Utah by Surg. Edward Francis. This investigation is reported on page 19.

Felix-Weil reaction.—Through the kindness of Dr. Carl L. Alsberg, chief of the Bureau of Chemistry, Department of Agriculture, the Hygienic Laboratory has had the good fortune to secure cultures which have been used by various workers in Europe for the serum diagnosis of typhus fever. The test is based on the agglutination of certain cultures of *B. proteus* by the serum of persons suffering with, or convalescent from, exanthematic typhus.

A note on the subject was published in the Public Health Reports.¹⁴ As a result of this brief communication there has been considerable demand for the cultures of *B. proteus*, which are used for the test, and a number of specimens of serum have been examined at this laboratory. Apparently we have in the Felix-Weil agglutination reaction a diagnostic procedure comparable to the Widal reaction in enteric fever.

¹⁴ Vol. 34, No. 44, Oct. 31, 1919.

Antirabic vaccine.—Experiments on laboratory animals were carried to completion showing that the various licensed modifications of the original Pasteur method of preparing the treatment result in preparations of definite prophylactic value.

During the year 31 patients were given the Pasteur treatment at this station and vaccine virus for 1,702 treatments was sent out to State health organizations, making a total of 1,733 treatments produced during the year. The vaccine was all manufactured in the Hygienic Laboratory and required the use of 1,334 rabbits and the entire time of one laboratory attendant and part of the time of one bacteriologist.

The following table shows the number of treatments sent Federal and State boards of health:

State.	Number of treatments sent during fiscal year.	State.	Number of treatments sent during fiscal year.
Alabama.....	464	Ohio.....	2
Arkansas.....	215	Oklahoma.....	85
Colorado.....	14	Oregon.....	34
Delaware.....	5	Panama Canal.....	13
Idaho.....	32	Porto Rico.....	10
Illinois.....	61	South Carolina.....	12
Iowa.....	12	Tennessee.....	108
Kansas.....	44	Texas.....	3
Kentucky.....	22	Utah.....	26
Massachusetts.....	103	Virginia.....	44
Maryland.....	62	Washington.....	52
Mississippi.....	197	West Virginia.....	5
Nevada.....	75		
New Jersey.....	2	Total.....	1,702

In view of the fact that a number of States have established Pasteur institutes, and as the treatment is readily available through commercial channels, it seems questionable whether the service should continue to furnish the vaccine to such State health departments as do not make provision for the distribution of the material to their citizens.

Antienteric vaccines.—In accordance with authority from the bureau, the manufacture of antienteric vaccines for distribution to various branches of the Public Health Service was discontinued, owing to lack of funds. However, the laboratory still makes enough of these products as standard for the use of manufacturers in testing their vaccines.

Examination of specimens.—The following table shows the number of specimens received and examined at the laboratory:

Wassermann:	
Positive	710
Negative	3, 653
Anticomplementary	59
Defective specimens.....	106
	4, 528
Heads for rabies:	
Positive	13
Negative	36
Not examined.....	10
	59
Smears for gonococci.....	121

Sputum for tuberculosis.....	1,742
Urine	574
Tissues	49
Cultures for diphtheria.....	1,398
Water and sewage.....	358
Disinfectants	88
Miscellaneous	298
	<hr/>
	9,215

DIVISION OF ZOOLOGY.

The professor of zoology has remained in charge of this division, although he has been on duty at the United States Marine Hospital, Wilmington, N. C., the entire year as chairman of the board on excreta disposal.

International Commission on Zoological Nomenclature.—The chief of the division of zoology, who is also secretary of the commission, took active steps following the signing of the armistice to get into touch with the other members of the international commission. Owing to the death of the president of the commission, the secretary has assumed the additional duties of this office. Acting upon the precedent established under somewhat different circumstances, the surviving members of the commission are reorganizing and will soon be ready to continue work.

Index catalogue of medical and veterinary zoology.—Proof of the extensive Nematode Catalogue has been read during the year, and it is now in press. Preparation of the Host Catalogue has been seriously interrupted by pressure of other work.

Examination for determination of intestinal parasites.—This part of the routine work of the division has been continued to some extent. Specimens have been examined from the National Training School for Boys and from various physicians and boards of health.

Specimen collection.—Owing to existing conditions, almost nothing has been done in regard to the collection of parasites during the past year.

Special details.—From July 1, 1919, to June 30, 1920, the chief of the division was stationed at the U. S. Marine Hospital, Wilmington, N. C., in charge of infectious diseases and as chairman of the board on excreta disposal. The annual report for this board is found on pages 70-72. Effective July 1, 1920, headquarters for the board on excreta disposal will be transferred to the Hygienic Laboratory.

DIVISION OF PHARMACOLOGY.

Prof. Carl Voegtlin has continued in charge of the Division of Pharmacology.

Chemotherapy of syphilis and related diseases.—Because of the very great importance of the eradication of protozoal diseases, particularly syphilis and malaria, the division has spent a great deal of time and effort on the investigation of problems concerned in the treatment of these diseases, by means of drugs with specific action upon the causative infective agents. As a continuation of the work of the previous fiscal year, these investigations have followed four distinct lines:

(1) Biological standardization of commercial arsphenamine and neoarsphenamine.

Six hundred and seventy-five lots of arsenicals have been examined. The work on this subject was done in order to safeguard as much as possible the patient receiving these antisyphilitic drugs. The method which was elaborated in this laboratory for this purpose has been gradually improved, until at present it is indispensable in the estimation of the toxicity of arsphenamine and its substitutes. The control of the commercial products by means of this method has led to the almost complete elimination from the market of dangerous lots.

A practical point brought out by this work was the discovery that prolonged shaking of neoarsphenamine solutions, as sometimes practiced in the clinic, increases the toxicity of the drug very considerably. Chemical work has furthermore proved that such solutions are very unstable and undergo rapid oxidation when exposed to air, with the formation of substances of higher toxicity. It was also shown that arsphenamine solutions under these same conditions are considerably more stable. These observations emphasize the necessity for the exercise of great care in the preparation of solutions of these drugs for clinical administration.

(2) Causes and prevention of arsphenamine intoxication. Some syphilitics receiving treatment with arsenicals are unduly susceptible to poisoning with these drugs, and severe liver and kidney disease results in a certain percentage of cases. The morbid changes produced by the drug in the organs of animals have therefore been subjected to careful analysis. It was possible to reproduce in animals the typical kidney and liver changes observed in patients. Particular attention was also given to the relation of diet to the production of these pathological changes. It was found that the quantity and quality of the food intake in the period preceding the injection of the drug has a marked influence on the amount of drug tolerated, an observation which may become of great practical value.

(3) Chemotherapeutic action. This phase of the work had for its purpose the study of the mode of action of arsenicals on the parasites in order to secure the necessary fundamental knowledge for the most advantageous therapeutic uses of arsphenamine, and furthermore to suggest new compounds which might prove more useful than this drug. The work was done on experimental trypanosomiasis, a disease closely related to syphilis. The results obtained emphasize the importance of properly adjusting the dose of the drug so as to establish an effective concentration of the drug in the blood and tissues. Smaller doses either kill off only part of the parasites or none at all. Treatment with small doses at long intervals will, therefore, not yield good results.

Conclusive evidence was obtained that arsphenamine must be converted within the body into another compound before it can exert its therapeutic effect.

The period of therapeutic action of various lots of arsphenamine and neoarsphenamine obtained from different manufacturers was also studied. These observations reveal the gratifying fact that the domestic preparations possess a therapeutic activity at least equal to the original German product.

(4) Treatment of syphilis of the central nervous system. On account of the peculiar anatomical conditions the parasites located in the central nervous system are not easily affected by the current methods of treatment, and for this reason the control of syphilis depends to a great extent on the development of methods which will accomplish this purpose. Work was therefore begun on this problem, beginning with the elaboration of a method by means of which it is possible to study the penetration of the central nervous system by active drugs. A biological method was devised for this purpose which very probably will prove extremely useful. It consists in the introduction of the parasites into the cerebro-spinal fluid where they survive for a considerable period of time. The effectiveness of the drugs is then determined by injecting the drugs intravenously, and searching the cerebro-spinal fluid at various intervals of time after the injection for the presence of live parasites.

Chemotherapy of tuberculosis.—Toward the end of the fiscal year, work was begun on the treatment of experimental tuberculosis in guinea pigs by means of compounds derived from chaulmoogra oil, a substance which has yielded very encouraging results in the similar disease, leprosy. On the assumption that chaulmoogric acid is the active ingredient of the oil, this substance was isolated in pure form and part of it converted into the ethyl ester. Preliminary to the experimental treatment, the toxicity of these compounds has been determined, and the best method of administration is being worked out at present.

Hookworm remedies.—The study of carvacrol, a synthetic preparation, was continued. Its toxicity and anthelmintic power was established. In cooperation with the Bureau of Chemistry of the Department of Agriculture, an extensive investigation has been begun having in view the isolation of an active principle from American worm-seed oil (chenopodium) which would possess constant toxicity and therapeutic efficiency.

Food value of dried milk.—In connection with the work done by the Division of Chemistry, and other parts of the service on dried milk powder, the food value of various brands of these products was investigated. These preparations, supplemented with enough butter fat to bring up the fat content of the mixture to that of fresh milk, possess a high nutritive value, which with the exception of the antiscorbutic vitamine, is equal to that of fresh unheated milk. Animals receiving this mixture show normal growth and health throughout long periods of time and reach adult size and weight. The principal conclusion of practical importance to be drawn from this work is that if dried milk is used for infant feeding, it should be supplemented by a small quantity of orange juice or canned tomatoes in order to prevent the occurrence of scurvy.

Report on poisoning by T. N. T. and other explosives.—The report on this subject is now in press, and will appear as Hygienic Laboratory Bulletin No. 126. It contains data of scientific and practical value.

United States Pharmacopoeial revision.—For the sake of assisting in the revision of the United States Pharmacopoeia, the division has continued the publications of the Digest of Comments of the United States Pharmacopoeia and the National Formulary. These comments contain abstracts of all the recent work having a bearing

on the United States Pharmacopoeia, and have proved to be very useful to the revision committee. Two issues of the comments (1916 and 1917) have been submitted for publication and are in press. The service of an additional assistant has become available temporarily through the cooperation of the Bureau of Chemistry of the Department of Agriculture, and it is hoped that the Digest of Comments for 1918-19 will soon be submitted for publication.

Routine work.—In connection with the control of arsphenamine, the arsenic content and toxicity of a large number of lots was determined. The routine chemical examination of this drug was transferred during the year to the Division of Chemistry. Numerous samples of drugs and foods were examined for various governmental agencies and private individuals. Memoranda were prepared in answer to a large number of inquiries of a pharmacological nature.

Aid to other departments of the Government.—Assistance of varying nature was given to the Department of Justice, the Bureau of Chemistry, and the War Risk Insurance Bureau.

Cooperation was particularly continued with the Bureau of Internal Revenue in the drawing up of regulations for the execution of the antinarcotic and prohibition laws.

DIVISION OF CHEMISTRY.

Disposal of chemical wastes.—The study of the problem of properly disposing of certain chemical wastes at Springfield, N. J., which was begun during the latter part of the preceding fiscal year was finished during this fiscal year. The results obtained have already been published in the Public Health Reports.¹⁵

Treatments that were successful on a 300-gallon scale, and that were cheaper than evaporation were found for the "lagoon liquor" of the Chemical Co. of America, for their monoethyl aniline wastes and the lake-forming dye wastes. Also a method of treating toluidine waste was indicated in laboratory experiments. Specific treatments of wastes were recommended to the Chemical Co. of America, based on their proposed production schedule.

Studies relating to the utilization of human excreta as fertilizer.—Studies were carried out in cooperation with the excreta board at Wilmington, N. C., which had for their object the development of improved methods for the sanitary disposal of human excreta and its utilization as fertilizer. A report on the results obtained has already been submitted, for the details of which reference may be had to the reports of the Division of Zoology.

Use of ultra-violet rays in water purification and of ozone in ventilation.—In response to requests for information concerning the use of ultra-violet rays in water purification and concerning the use of ozone in ventilation, some abstracts of the literature on these subjects were compiled. These were published in the Public Health Reports.¹⁶

Reconstructed milk studies.—The experimental study of the relative value of reconstructed milk as a food for growing animals in comparison with normal milk which was begun during the latter part of the preceding fiscal year, in cooperation with the Division

¹⁵ Vol. 35, No. 4, Jan. 23, 1920.

¹⁶ Vol. 34, No. 50, Dec. 12, 1919.

of Pharmacology, was continued during this fiscal year. This work involved the chemical examination of the milks used in these experiments. In connection with this work, there were carried out during this year, determinations of protein, total solids and fat on about 400 samples of milk. For the results obtained in the feeding experiments, reference may be had to the report of the Division of Pharmacology, page 82.

Detection and estimation of poisonous nitro compounds.—The method which was developed during the preceding fiscal year for detecting and estimating small amounts of T. N. T. in air, was found to be adaptable to other nitro compounds. Accordingly, some work was carried out along this line and a number of nitro compounds other than T. N. T. were studied. Some of the results obtained have already been written up in manuscript form.

Detection and estimation of toxic impurities in arsphenamine and neoarsphenamine.—Studies have been started which have for their object the working out of suitable methods for the detection and estimation of toxic impurities in arsphenamine and neoarsphenamine. This work is still in progress.

Chemical examination of arsphenamine and other arsenicals.—Since November, 1919, the routine chemical examination of arsphenamine and related arsenicals have been carried out in the Division of Chemistry. During this period there were examined about 600 preparations of arsphenamine, neoarsphenamine, etc.

Chemical examination of serums.—Determinations of the preservative were made in 115 samples of therapeutic serums. In the case, of most of these there were also carried out determinations of the total solids.

Work for other Government departments.—Determinations of dissolved oxygen in 66 samples of Potomac River water were made for the superintendent of sewers of the District of Columbia. A certain liquid which was submitted by the Department of Justice was examined for the presence of poisons. Some control tests were made for the War Department in connection with the manufacture of reconstructed milk at one of their cafeterias.

Assistance to other branches of the service.—Assistance was rendered in connection with the pellagra studies by preparing certain salt mixtures and by analyzing several samples of commercial casein. The total and soluble lead were determined in 19 samples of glazes which were submitted by the Industrial Hygiene Division.

Miscellaneous.—Considerable time was spent by a member of the division in connection with the manufacture at the Hygienic Laboratory of the arsenical "Larsfen." Twenty miscellaneous samples were analyzed and 48 miscellaneous solutions were prepared. The Division of Pathology and Bacteriology was supplied with all the required chemical reagents and standard solutions.

Various memoranda were prepared in response to a large number of inquiries regarding health problems of a technical nature.

COOPERATION WITH BUREAU OF FISHERIES.

On request of the Bureau of Fisheries samples of barracuda of the Pacific coast were tested at the Hygienic Laboratory in connection with the investigations being made on the possible poisonous proper-

ties of this species of fish. The samples examined were not of a poisonous nature. The investigation was too limited, however, to exclude all possibility of poisoning from the consumption of barracuda. It was recommended that further tests be made at the point where the fish are taken and packed.

COOPERATION WITH THE KENTUCKY STATE LABORATORY.

Passed Asst. Surg. H. E. Hasseltine was detailed in May, 1920, at the request of the State health officer of Kentucky to instruct the State laboratory staff in the manufacture of typhoid vaccine.

VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS.

In connection with the enforcement of the law of July 1, 1902, governing the manufacturing, importation, and sale of viruses, serums, toxins, and analogous products, inspections were made of American and European establishments holding or applying for licenses.

There are at present 38 concerns licensed for the interstate sale of viruses, serums, toxins, and analogous products in the United States. Of these 30 are located in the United States, 1 in Canada, 1 in England, 3 in France, 1 in Italy, and 2 in Switzerland. During the year a number of other firms applied for licenses, but an inspection of their establishments and products revealed conditions which did not warrant recommendations for licenses.

It is interesting to note that 93 different products are now licensed for interstate sale in the United States. They cover a very wide range of products and many samples of each product have to be examined. Such of them as have a potency standard prescribed are submitted to the Hygienic Laboratory for potency tests as well as tests for purity. Those for which a standardized test has not been provided are examined for purity only.

In accordance with an opinion of the Solicitor of the Treasury, arsphenamine, neoarsphenamine (salvarsan, neosalvarsan), and allied preparations are regarded as subject to control under the act of July 1, 1902. The service, therefore, has taken over from the Federal Trade Commission the control of the manufacture and importation of these products. It is believed that the products made in this country are now equal to if not superior to those made in foreign countries.

During the year 675 lots of arsenicals submitted to the laboratory were tested as to toxicity and arsenic content. Of the 38 licensed establishments mentioned above, 8 are licensed for the manufacture or importation of arsphenamine and allied preparations. Two of these are foreign.

Regulations for the control of arsphenamine, neoarsphenamine, and sodium arsphenamine were issued by the Secretary of the Treasury June 21, 1920, supplementing the regulations for the control of viruses, serums, etc., approved February 12, 1919. These regulations were prepared by a board composed of the Surgeons General of the Army, Navy, and Public Health Service.

The laboratory investigations relating to viruses, serums, toxins, and analogous products are reviewed on pages 75, 81, 83, and 84.

CONFERENCE WITH STATE AND TERRITORIAL HEALTH AUTHORITIES.

Forty-two States were represented at the eighteenth annual conference of the State and Territorial Health Authorities with the United States Public Health Service which was held in Washington May 26-27, 1920. In addition to the general sessions of the conference, separate sectional meetings were held by venereal-disease control officers and sanitary engineers with representatives of the service.

The program follows:

Public Health administration:

Discussion of data obtained from questionnaire concerning whole-time county health officers in the various States.

Coordination of effort and promotion of efficiency in field of sanitary engineering.

Child hygiene:

Discussion of Fess bill for physical education promoted by the National Physical Education Service.

Discussion of Sheppard-Towner bill for public protection of maternity and infancy.

Report of child-hygiene activities of the service.

Endemic index and communicable-disease control.

Malaria:

Extension of cooperative malaria work.

Better morbidity reports.

Rural sanitation:

Determination of a workable plan of presenting financial equivalents in county health work

Rural sanitation with special reference to county demonstration work with small budgets in Virginia.

Discussion of cooperative demonstration work in rural sanitation in Virginia.

Mosquito film.—Produced by the Public Health Service in cooperation with the Reclamation Service, Bureau of Fisheries, and the Bray Studios.

Public-health nursing film.—Prepared by Dr. C. St. Clair Drake.

Provision for lepers.

Migration of tuberculous persons.

Report of resolutions committee.

Venereal diseases:

Control of venereal diseases with reference to the relation of the United States Public Health Service to States and cities in handling this problem.

Maritime quarantine against the importation of venereal diseases in their active stages.

Committee reports were made in regard to sanitation of public conveyances, interstate quarantine regulations, rural sanitation, and trachoma, and a progress report of the board of excreta disposal was given.

A report of the conference, including the resolutions passed, has been printed in the Public Health Reports,¹⁷ and the proceedings in full will be published by the service.

REPRESENTATION AT MEETINGS OF SCIENTIFIC AND SANITARY ASSOCIATIONS AND CONGRESSES.

During the year service officers have attended a large number of annual and other meetings of scientific and sanitary associations and congresses. In most cases the representatives have given papers relating to public health, and in all have gained information of importance to the work of the service.

¹⁷ Vol. 35, No. 23, June 4, 1920.

DISSEMINATION OF INFORMATION.

Information regarding the results of studies and investigations of the division has been disseminated by means of interviews and conferences with health authorities following particular studies within their jurisdiction, publications, other reports, lectures, and correspondence.

Interviews and conferences.—The results of investigations undertaken on the request of State and local authorities to meet an emergency are often given verbally as soon as obtained with recommendations submitted for the improvement of the existing conditions in order that remedial action may be immediately taken.

Publications.—Articles on health topics are prepared for the weekly Public Health Reports, in reprints of these reports, and for special publications, such as Public Health Bulletins and Hygienic Laboratory Bulletins. Many of the investigations referred to above are reported in these publications.

Other reports.—In many cases typewritten reports of investigations are furnished the authorities concerned.

Lectures.—In addition to addresses given at meetings of scientific and sanitary associations popular lectures are given from time to time. By these lectures officers in the field bring to the attention of the public health activities of the service.

Correspondence.—A large number of replies are made to letters requesting information of a hygienic or public health nature.

DIVISION OF DOMESTIC (INTERSTATE) QUARANTINE.

The activities of the division during the past fiscal year included plague suppressive measures, control of water supplies used by interstate carriers, and the carrying out of the bureau policies for the prevention of epidemics by building up and improving divisions of communicable diseases, and sanitary engineering in State health departments.

PLAGUE SUPPRESSIVE MEASURES.

The operations for the control of plague in ground squirrels in California have been continued. The infected area has been delimited by laboratory examination of squirrels resulting from intensive squirrel destruction at the borders of the known infected territory. Squirrel free zones have been maintained between the infected territory and the rat population of the cities of San Francisco, Oakland, and Berkeley.

A new outbreak of plague occurred in New Orleans, the first human case being discovered October 29, 1919. It was necessary to place in the field a large force of trappers, fumigators, and other personnel. Fifteen human cases occurred up to June 30 and 558 infected rats were demonstrated during this period. Over 250,000 rats have been trapped and examined in the laboratory, and the infection may now be said to be under control, although intensive trapping and other field measures should be maintained through the coming fiscal year.

Plague appeared in Pensacola June 14, in Galveston June 16, and Beaumont June 26, the first human cases occurring on those dates. Active field operations were at once instituted, similar to those employed successfully at New Orleans, and the control of the infection in these new foci will not be difficult, provided sufficient funds are available.

The sudden outbreak in New Orleans made necessary a deficiency appropriation to carry on the work for the entire fiscal year. Two hundred thousand dollars was asked for, but only \$100,000 was granted; as a consequence it was necessary to suspend operations to a large extent in June at New Orleans, and to secure a transfer of funds from other appropriations to keep within the funds allowed.

It was carefully explained to the appropriation committee at the time the deficiency was requested that \$400,000 was inadequate for successful plague operations on such a scale, and it was recommended that the appropriation for 1921 be made \$800,000 instead of \$400,000. Congress appropriated \$355,000, and as a result there will be no funds to continue after October 15. This condition of affairs is especially serious because Congress does not convene until December.

PLAGUE SUPPRESSIVE MEASURES IN CALIFORNIA.

OPERATIONS IN SAN FRANCISCO.

The activities of the service in the city of San Francisco during the fiscal year have been confined to condemnation proceedings, inspections of food places, and observation of the provisions of the city ordinances relating to rat-proof construction, assistance being furnished by the city. Constant representations made to the city authorities by service officers concerning the possibility of plague infection in the rat population and the necessity of permanent employment of a force of trappers culminated in the city's acquiescence for the fiscal year 1920-1921.

OPERATIONS FOR THE ERADICATION OF PLAGUE AMONG GROUND SQUIRRELS.

During the year activities of the service were extended from the three bay counties of Alameda, Contra Costa, and San Mateo to the seven counties of Santa Clara, Santa Cruz, Monterey, San Benito, Merced, Stanislaus, and San Joaquin, where plague among ground squirrels has heretofore been in existence.

Cooperative relations have been established with the various county horticultural commissioners, boards of supervisors, and farm bureaus, and the State department of agriculture, and continued with the State board of health. The long-continued efforts of the service in this work have resulted in a general education of the landowners to the end that only occasionally is difficulty experienced in securing their cooperation in eradication work.

Hunting operations were carried on during April, May, and June, during which time 45,953 squirrels were collected and 45,892 examined at the laboratory. Of this number 185, or 0.4 per cent, were proved to be plague infected.

The following table shows squirrels collected and examined, with numbers infected, with percentage, by counties:

County.	Squirrels collected.	Squirrels examined.	Squirrels infected.	Percentage infected.
Santa Cruz.....	1,874	1,874	26	0.01387
Alameda.....	10,681	10,681	57	.00542
San Benito.....	2,863	2,862	15	.00506
Santa Clara.....	2,626	2,626	12	.00456
Contra Costa.....	12,406	12,406	56	.00451
San Joaquin.....	1,780	1,780	4	.00224
Monterey.....	2,345	2,345	4	.00170
Merced.....	910	910	1	.00109
San Mateo.....	7,789	7,789	7	.00089
Stanislaus.....	2,663	2,663	2	.00075

Areas of heavy infection have been demonstrated in the first five counties while the last five yielded fewer infected squirrels and from widely scattered sections.

The following table gives the result of the squirrel eradication work:

Inspections.....	3,567
Reinspections.....	3,229
Acres inspected.....	1,166,777
Acres reinspected.....	1,230,619

Acres treated:

Pumps	7,541
Waste balls	198,581
Poisoned grain	507,929
Hose and funnel	3,182
Number of holes treated	1,077,662
Material used:	
Waste balls	1,077,662
Pounds of poisoned grain	198,126
Gallons CS ₂	18,104

Measures for the examination of rat food.

Rat complaints	494
Manure and stable complaints	59
Chicken, rabbit, pigeon, etc., complaints	368
Garbage and defective garbage cans	121
Rubbish complaints	31
Plumbing complaints	109
Insanitary premises, including shacks	236
Stench complaints	99
Goat, dog, and cat complaints	42
Mosquito, fly, and flea complaints	39
Swine complaints	20
Miscellaneous (petty)	54

NOTE.—All of the above complaints are investigated by the inspectors, the necessary notices prepared and sent out, and reinspections made to determine as to whether the existing nuisances are abated.

Measures taken for the destruction of rat food.

Premises inspected	20,098
Nuisances abated	2,882
Complaints investigated	1,672
Garbage cans installed	1,496
Chicken yards abandoned	137
Chicken houses concreted (sq. ft. 795)	11
Chickens, pigeons, rabbits, etc., disposed of	1,650
Plumbing complaints referred to board of health	107
Vacant lots cleaned	32
Basements cleaned	149
Yards cleaned	47
Premises cleaned of rubbish	17
Lots from which stagnant water has been pumped	3

Measures taken for the destruction of rat harbors.

Floors torn up	376
Basements torn up	40
Yards torn up	51
Buildings destroyed	246
Stables destroyed	18

Measures for the permanent rat proofing of buildings.

RAT PROOFING OF FOOD PLACES.

Buildings rat proofed by concreting	309
Basements concreted (140,310 sq. ft.)	72
Floors concreted (412,211 sq. ft.)	248
Yards concreted (1,775 sq. ft.)	7
Passageways concreted (520 sq. ft.)	2
Sidewalks concreted (3,700 sq. ft.)	4
Total area square feet concrete laid	558,516
Area walls installed (36,112 cu. ft.)	115
Buildings rat proofed by area walls and wire cloth (51,590 sq. ft.)	52
Ventilators on roofs screened	25
Sidewalk gratings screened	45
Lens lights replaced	555

Doors rat proofed.....	10
Openings in walls, ceilings, and floors, and around pipes closed by wire cloth and cement.....	4,921
Finished ceilings removed from basement (22,875 square feet).....	11

EXISTING NONRAT-PROOF BUILDINGS REPAIRED, USING RAT-PROOF MATERIALS.

Buildings rat-proofed by concreting.....	55
Basements concreted (20,850 square feet).....	16
Floors concreted (61,875 square feet).....	35
Yards concreted (1,000 square feet).....	2
Sidewalks concreted (3,750 square feet).....	3
Total square feet laid in old premises.....	87,475
Area walls installed (11,850 cubic feet).....	31

BY CONDEMNATION PROCEEDINGS.

Buildings submitted to board of health for condemnation.....	162
Buildings acted on by board of health and condemned.....	104
Buildings acted on by board of health and not condemned.....	58
Buildings abated following condemnation proceedings.....	163
Buildings condemned and remaining unabated.....	64

HUMAN PLAGUE.

During the period of August 15 to September 11, 1919, 13 cases of rapidly fatal pneumonia occurred in Oakland. From bacteriological evidence obtained in two cases, information on history of contact and clinical data, all cases were attributed to plague. On April 20, 1920, a fatal plague case was noted at the Alameda County Hospital.

INTERSTATE SANITARY LABORATORY.

A résumé of the work by the laboratory together with certain data connected with water analysis, follows:

Blood for Wasserman reaction:

United States Marine Hospital—	
San Francisco.....	2,088
Los Angeles.....	154
United States Public Health Service Hospital—	
Palo Alto.....	13
War Risk Insurance—	
San Francisco.....	106
San Jose.....	2
Mount Zion Hospital, San Francisco.....	1
La Vina Sanitorium, Los Angeles.....	3

Cerebrospinal fluid for Wasserman reaction:

United States Marine Hospital—	
San Francisco.....	24
Mount Zion Hospital, San Francisco.....	1

Blood culture for typhoid bacilli (United States Marine Hospital, San Francisco)

3

Blood for Widal reaction (United States Marine Hospital, San Francisco)

3

Guinea pig inoculation for tuberculosis (United States Marine Hospital, San Francisco)

36

Sputum.....	21
Urine.....	5
Fluid from knee joint.....	1
Pus.....	2
Feces.....	1
Shoulder fluid.....	1
Hydrocele fluid.....	1
Cerebrospinal.....	1

Dr. O. J. Bemis, Big Creek, Calif.—

Sputum (J. P. and microscopic).....	1
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Mount Zion Hospital, San Francisco—

Sputum.....	2
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Feces for typhoid bacilli (United States Marine Hospital, San Francisco).....	5
Feces for paratyphoid A and B (United States Marine Hospital, San Francisco)	1
Feces for cholera and dysentery (United States Immigration Hospital, A. I.)	
Microscopical examination and culture from heart tissue (United States Marine Hospital, San Francisco)	1
Tissue for histological examination (United States Marine Hospital, San Francisco)	99
Catgut and gauze for sterility test (United States Marine Hospital, San Francisco)	31
Pus for dark field examination (United States Marine Hospital, San Francisco)	1
Bloody fluid for culture, smears, and guinea pig inoculation (United States Marine Hospital, San Francisco)	1
Guinea pig inoculation for streptococci (United States Marine Hospital, San Francisco)	1
Antistaphylococcus vaccine (War Risk, S. F.)	1
Culture for diphtheria (United States Marine Hospital, San Francisco)	1
Autogenous vaccine (United States Marine Hospital, San Francisco)	7

Rodent examination.

	Received.	Examined.	Infected.
Squirrels.....	45,953	45,892	185
Rats.....	9,950	9,950	
Gophers.....	2	2	
Rabbits.....	39	39	
Weasels.....	4	4	
Mice.....	1,459	1,459	
Total.....	57,406	57,346	185

Two squirrels were found infected with plague-like disease, *B. tularensis*.

Bacteriological examination of water:

Amador Central Railroad Co.....	3
California Southern Railroad Co.....	2
Camino, Placerville & Salt Lake Railroad Co.....	2
Central California Traction Railroad Co.....	3
McCloud River Railroad Co.....	3
Modesto & Empire Railroad Co.....	1
Nevada Central Railroad Co.....	4
Nevada Copper Belt Railroad Co.....	4
Northwestern Pacific Railroad Co.....	15
Pacific Coast Railroad Co.....	5
Pajaro Valley Railroad Co.....	3
Sacramento Northern Railroad Co.....	9
San Diego & Arizona Railroad Co.....	4
San Joaquin & Eastern Railroad Co.....	7
San Pedro, Salt Lake & Los Angeles Railroad Co.....	7
Santa Fe Railroad Co.....	31
Sierra Railway Co. of California.....	3
Southern Pacific Railroad Co.....	65
Tonopah & Tidewater Railroad Co.....	3
Western Pacific Railroad Co.....	11
Yosemite Valley Railroad Co.....	4

Miscellaneous bacteriological examination of water:

Antelope Creek & Red Bluff Water Co.....	2
Arrowhead Springs, U. S. Public Health Service Hospital.....	4
Belvedere Land & Water Co.....	7
Oroville City Water Co.....	1
Spring Valley Water Co.....	1
U. S. Marine Hospital, San Francisco.....	12

Examinations of water supplies on interstate carriers.

Sources of water supplies in the district of the Pacific.....	108
Samples of water examined.....	189
Samples of water conforming to Treasury Department standard.....	148
Samples of water not conforming to Treasury Department standard....	41
Sources of supply certified.....	91
Sources of supply not certified.....	3
Sources of supply certified after improvements were installed.....	7
Sources of supply condemned.....	2
Sources of supply discontinued during the year.....	5
Miscellaneous examination of water samples.....	27

PLAGUE SUPPRESSIVE MEASURES AT SEATTLE, WASH.

During the fiscal year ending June 30, 1920, all plague suppressive and preventive measures on Puget Sound were continued as in former years under the supervision of this station. The work was carried on with all the usual activities. No plague-infected rodents were found since the cases reported March 30, 1917.

Rat proofing of buildings.

New buildings inspected.....	613
New buildings reinspected.....	949
Basements concreted, new buildings (358,140 square feet).....	218
Floors concreted, new buildings (441,850 square feet).....	212
Yards, etc., concreted, new buildings (92,910 square feet).....	69
Sidewalks concreted (292,880 square feet).	
Total concrete laid, new buildings (1,185,780 square feet).	
New buildings elevated.....	71
New premises rat proofed, concrete.....	430
Old buildings inspected.....	46
Premises rat proof, concreted, old buildings.....	40
Floors concreted, old buildings (66,575 square feet).....	40
Premises otherwise rat proofed, old buildings.....	10
Opening screened, old buildings.....	105
Rat holes cemented, old buildings.....	410
Wooden floors removed, old buildings.....	40
Doors rat proofed, old buildings.....	5
Wire screening used (2,295 square feet).	
Buildings razed.....	42

Water front.

Vessels inspected and recorded.....	544
Vessels fumigated.....	136
Sulphur used, pounds.....	183,600
New rat guards installed.....	319
Defective rat guards repaired.....	517
Fumigation certificates issued.....	136
Canal Zone certificates issued.....	49
Port sanitary statements issued.....	1,992

Laboratory operations.

Dead rats received.....	291
Rats trapped and killed.....	16,509
Rats after fumigations.....	1,592
Total rats.....	18,392
Rodents examined for plague infection.....	14,590
Rodents proven plague infected.....	0
Blocks poisoned.....	34
Poison distributed, pounds.....	689

Classification of rodents.

<i>Mus rattus</i>	2, 277
<i>Mus alexandrinus</i>	4, 553
<i>Mus norvegicus</i>	9, 584
<i>Mus musculus</i>	1, 978
Unclassified	

Miscellaneous work.

Letters sent contractors, rat proofed, N. B.	530
Letters sent re rat complaints	48

Interstate sanitary laboratory.

Water samples examined for <i>B. coli</i>	80
Sputums for tubercle bacilli	541
Smears for gonococci	276
Urinalyses	990
Urinalyses (microscopic)	86
Quantitative test for albumin	25
Stools examined for blood	2
Pus smear for empyema	1
Blood counts	19
Smear for staphylococci	1
Widals	1
Smears for spirochaetes	3
Smear from rectal abscess	1
Stools examined for ameba	5
Pus from plural cavity examined	1
Sputum for pneumococci	1
Sputum for diplococci, streptococci, etc	1
Stools examined for dysentery	3
Stool for uncinariasis	1
Smear for <i>Mic Catarrhalis</i>	1
Urine examined for prostatitis	1
Smear for streptococci	1
Section examined for epithelioma	1
Blood for malaria	3
Smear from abscess for tubercle bacilli	2
Urine for blood	4
Urine for tubercle bacilli	2
Smear for Koch-Weeks bacilli	2
Lactose media (cubic centimeter)	5, 000
Blood for Wassermanns	524
Stools examined for ova parasites	4, 885
Ascaris found in primary examination	980
Tricecephalis found in primary examination	2, 122
Uncinariasis found in primary examination	718
Other parasites found in primary examination	472

PLAGUE SUPPRESSIVE MEASURES AT NEW ORLEANS, LA.

During the fiscal year ending June 30, 1920, all plague suppressives and eradicated measures in the city of New Orleans were conducted as in former years under the supervision of the United States Public Health Service, working in close cooperation with State and city authorities.

The sixth year of the campaign may, for the purpose of description, be divided into—

1. The period of comparative inactivity extending from July 1, 1919, to October 29, 1919.
2. The plague reappearance period, beginning October 29, 1919.

With a personnel of 13 men, service operations during the first period were conducted for the following purposes:

(a) Fumigation of such vessels as were remanded from quarantine, and such others as requested treatment.

(b) Trapping operations along areas adjacent to wharves, on wharves, and on ships.

(c) Examination of rodents for plague infection and such other laboratory work as was required in the service laboratory.

(d) Prosecution of cases pending in the city courts for infraction of rat-proofing laws.

(e) Such clerical work as was incident to the foregoing procedure.

From June 30, 1916, to October 29, 1919, very little had been done toward the completion of the work for rat proofing the city wharves. However, reconstruction of premises in the city proper for the elimination and prevention of rat harborage had continued. As a result of part-time trapping, 3,643 rats were captured and sent to the laboratory for examination and classification.

During the latter part of October, an outbreak of human plague occurred, and immediately thereafter rodent plague was found, the first since April 3, 1917.

INCEPTION OF THE EPIDEMIC.

(Outbreak of October, 1919.)

The first case (consecutive case No. 32) of human plague officially recognized was that of H. E. D., who died in the charity hospital on October 29, 1919. This was the first case recorded since September 8, 1915.

Fifteen cases in all were found, 10 recovered and 5 died. The hospitalization and treatment of the various cases was attended to by the city board of health.

On inspection of all premises, both patients' residences and places of employment, it was found that each building was being maintained in compliance with city ordinance No. 2512 C. C. S. governing rat proofing, with the possible exception of apparently unimportant minor defects.

The simultaneous discovery of the first five cases of bubonic plague residing in various parts of the city, but all employed in the vicinity of Poydras and South Front Streets, left little doubt as to the location of the focus.

As Poydras Street is within 200 yards of Poydras Dock, and the ground surface between these two structures is unobstructed, the docks not rat proofed were at once suspected of being the principal rat harbors.

The fact that the cases of bubonic plague with one exception occurred among employees who worked in or near food depots was considered of epidemiological significance, and accordingly special attention was devoted to this class of buildings.

GENERAL ORGANIZATION.

Passed Assistant Surg. M. S. Lombard was placed in charge of all plague suppressive measures in New Orleans, La. The staff of the medical officer in charge was organized with Passed Asst. Surg. R. R.

Spencer, on duty at the Laboratory, Asst. Surgs. R. C. Williams, M. F. Haralson, and Acting Asst. Surgs. Park Howell, M. F. Smith, J. Menendez, R. E. Bodet, J. W. Rosenthal, on duty with the field forces. All laboratory measures in connection with the suppression of bubonic plague in New Orleans were under the supervision of Passed Asst. Surg. C. L. Williams. This work included not only routine examination of rodents, but also experimental plague work on animals. The total force consisted of a maximum of 362 men. All employees were selected at Headquarters and assigned to the various divisions. In their selection special attention was paid to physical fitness and mental qualifications. Men with an honorable discharge from the United States Public Health Service, Army, or Navy were given preference. Many former employees were reinstated.

The plan of organization was modeled after a sanitary district as existed in the 1914 campaign, on a greatly enlarged scale. The plan of campaign decided upon embraced both general and special measures. Under general measures fell publicity, rodent destruction, laboratory examinations, rat proofing, proper collection and disposal of garbage, and outgoing quarantine, both overland and maritime. Under special measures fell the treatment of foci by fumigation with hydrocyanic gas, destruction of fleas by pulicide solution, and summary destruction of rodent harborage in and about each focus.

PUBLICITY CAMPAIGN.

While no effort was made to give the situation undue publicity, still it was believed the best policy to advise interested parties fully and frankly of the progress of the infection. Meetings were held principally with city and State officials, the dock board, representatives of various railroads, the business interests, the medical society, and other organizations, and with each the situation was freely discussed. On all occasions full support and active cooperation was promised and carried into effect.

Of special importance was the conference held in the city hall, with city officials, on November 25, 1919, for the purpose of discussing the unfinished city rat proofing, at which the following conclusions were reached.

As the city is about 90 per cent rat proofed, the remaining 10 per cent will be required to fully comply with the provisions of city ordinance No. 2512 C. C. S. It was agreed to notify the public through the press that all rat proofing must be completed and all premises not rat proofed must be done at once. Those not complying will be proceeded against legally and promptly. All cases in the recorder's court will be tried at once. There will be no further extensions granted, the full process of these courts will be invoked to compel persons to appear for trial, and if prosecution in the recorder's court does not produce the necessary result, city officials will be compelled to proceed by injunction when necessary to prevent the use or occupation of the property not rat proofed.

While there are some cases in New Orleans where persons have been temporarily prevented through lack of means from doing the work, it is believed that five and a half years since the adoption of

the rat-proofing ordinance is ample time for all persons to have arranged for means to comply with the provisions of this important ordinance.

The frankness of the New Orleans authorities and of the press probably operated more than any other feature in establishing confidence in the neighboring States and foreign countries that every precaution was being exercised to prevent the spread of the disease and that nothing was being concealed. This undoubtedly saved the city from burdensome restrictions and secured a relatively free and unrestricted commerce.

OUTGOING QUARANTINE.

With the appearance of plague the following maritime quarantine restrictions were at once ordered:

All vessels mooring at local wharves were required to fend off 4 feet.

All mooring lines were required to have properly placed rat guards.

All gang planks were required raised at night.

All vessels bound for other ports of the United States (including river ports), its dependencies, and possessions, were required fumigated for rodent destruction prior to departure. Later, vessels bound for Cuban, Mexican, Haitian, and San Domingo ports were fumigated as well. The fumigant used was hydrocyanic gas.

In addition to the outgoing requirements on the Mississippi River a station was established along the navigation canal where vessels plying between New Orleans and outside ports, through Lake Pontchartrain, were likewise treated.

As a result of this ship fumigation two infected rats were secured. A brief history of these cases follows:

Infected rat No. 277, female *rattus*, was killed by fumigation on December 24, 1919, and confirmed as plague infected on December 30, 1919. This rat was found on the S. S. *Managua*, of the Bluefield Line, which vessel had been continuously engaged in the Nicaraguan trade. Upon arrival in New Orleans the *Managua* unloaded her banana cargo at the Thalia Street Wharf, and when this was completed the vessel was shifted to the Robin Street Wharf, where fumigation took place that resulted in securing 10 *Mus alexandrinus* and 5 *Mus rattus*.

Infected rat No. 496, male *alexandrinus*, was killed by fumigation on February 12, 1920, and confirmed as resolving plague infected on February 24, 1920. This rat was found on the British S. S. *Historian*, from which vessel 20 *Mus alexandrinus*, 28 *Mus rattus*, and 1 *Mus musculus* were secured by fumigation.

The *Historian* arrived in the port of New Orleans at 8 p. m. February 4, 1920, and departed at 6.30 a. m. February 24, 1920. Upon arrival the vessel tied up at St. Andrew Street Wharf. At 2.30 p. m. February 10, 1920, the vessel was moved from this wharf to the Stuyvesant Dock, section 5. At noon February 14, 1920, the vessel was moved to the Chalmette Slips, from which she was again moved at 4.15 p. m. February 16, 1920, to the St. Andrew Street Wharf. The vessel left the St. Andrew Street Wharf at 6 a. m. February 19,

1920, for Westwego, and sailed therefrom at 6.30 a. m. February 24, 1920.

While the *Historian* was alongside the St. Andrew Street Wharf on February 6, 1920, the afternoon inspection showed one defective rat guard, which was remedied at once. This is the only report of any failure on the part of the vessel to observe all quarantine precautions. Fumigation took place while empty, on February 12, 1920, at the Stuyvesant Dock.

The ports of call of the S. S. *Historian* for the previous 12 months were:

Left Liverpool April 13, 1919, for New Orleans.
 Left New Orleans May 11, 1919, for Liverpool.
 Left Liverpool July 8, 1919, for New Orleans.
 Left New Orleans August 7, 1919, for Liverpool.
 Left Liverpool September 27, 1919, for Calcutta.
 Left Calcutta November 15, 1919, for Liverpool.
 Left Liverpool January 16, 1920, for New Orleans.
 Left New Orleans February 24, 1920, for Liverpool.

The *Historian* entered New Orleans February 4, 1920, from Calcutta, by way of Liverpool, and it may be that the source of plague infection was one of the above-mentioned ports. The time during which she was not protected while in this port on this trip was so small as to be negligible, and the only avenue of possible infection was one defective rat guard, which could not have been disarranged, except between the hours of 10.30 a. m. and 2 p. m. February 6, 1920, since inspection before and after these hours showed all precautions taken.

Tabulated operations of out-going quarantine were as follows:

Vessels inspected for rat guards.....	¹⁸ 14, 075
Vessels fumigated with sulphur.....	1
Vessels fumigated with cyanide gas.....	1, 078
Pounds of sulphur used.....	65
Pounds of cyanide used.....	68, 513
Pints of sulphuric acid used.....	103, 044
Number of vessels fumigated, certificates issued.....	1, 079
Clean bills of health issued.....	2, 071
Foul bills of health issued.....	29
Number of vessels cleared.....	2, 100
Total number of bills of health issued, including additional ports of call.....	3, 936
Total number of rats killed by fumigation of vessels.....	1, 564
By species:	
<i>Mus norvegicus</i>	9
<i>Mus rattus</i>	615
<i>Mus alexandrinus</i>	906
<i>Mus musculus</i>	34
Number fumigated rodents found plague infected.....	2

To prevent the spread of infection through outbound freight cars, the following measures were enforced:

All cars not rat proofed were required rat proofed before loading.

Structures not rat proofed were ordered to discontinue the handling of outbound freight.

All car doors of freight cars alongside structures not rat proofed and buildings rat proofed as class B, were required kept closed at night.

¹⁸ Each entry and each shifting of mooring counted.

LABORATORY.

All rodents secured by the field forces were sent to the laboratory for classification and examination. Rodents were dissected and examined and records kept of the location of each rodent received. A flea survey and the various procedures necessary for the confirmation of human and rodent infection were carried out. To the end of the fiscal year there have been classified and examined at the laboratory 260,488 rodents, by species, as follows:

Species.	Total number examined.	Male.	Female.
<i>Mus norvegicus</i>	103,175	24,374	78,801
<i>Mus rattus</i>	8,631	2,522	6,109
<i>Mus alexandrinus</i>	15,086	4,322	10,764
<i>Mus musculus</i>	123,804	36,658	87,146
Wood rats.....	527	205	322
Unclassified.....	1,213		
Putrid.....	8,052		
Total.....	260,488	68,081	183,142

In addition to the above, the laboratory reported the receipt of the following animals, by species:

Muskrats.....	61
White rats.....	23
Banana rats.....	4
Rabbits.....	2
Guinea pigs.....	4
Opossums.....	16
Leather-wing bats.....	12

Total animals, all species, classified and examined, 260,615.

The total number of infected rodents (569), by species, were as follows:

	Total.	Male.	Female.
<i>Mus norvegicus</i>	270	120	150
<i>Mus rattus</i>	143	66	77
<i>Mus alexandrinus</i>	125	61	64
<i>Mus musculus</i>	29	13	16
Guinea pig (test animal).....	1	1	
Wood rat (<i>Hesperomys Polustris</i>).....	1	1	

From the latter part of January, 1920, to June 30, 1920, 2,152 live rats were examined for fleas, by species as follows:

<i>Mus norvegicus</i>	2,045
<i>Mus alexandrinus</i> and <i>mus rattus</i>	97
<i>Mus musculus</i>	4
Muskrat.....	1
Wood rat.....	5

The following table gives detailed information of general laboratory work:

Number of bacteriological specimens examined.....	140
Number of pathological specimens examined.....	137
Number of Wassermann reactions made.....	2,209
Total specimens examined.....	2,486

Intensive trapping was practiced at all times and it seems safe to assume that the extent of the infection was accurately mapped out. This was found to be located principally along the river, along the old basin canal, the navigation canal and many other canals in the city. These sections on inspection were noted to be well sown with food depots, junk yards, and many important structures still remaining not rat proofed.

The rat catch per month and the average daily rat and mouse catch per man from November 1, 1919, is given in the following table:

Month.	Trapping days.	Number of rats.	Rats per man per day.	Number of mice.	Mice per man per day.
1919.					
November.....	1,337	7,132	5.33	3,805	2.85
December.....	3,037	11,319	3.72	15,927	5.28
1920.					
January.....	4,003	12,213	3.05	15,508	3.98
February.....	5,065	13,469	2.66	16,749	3.36
March.....	5,687	16,576	2.91	19,756	3.54
April ¹	6,081	21,775	3.58	23,597	3.88
May ¹	5,670	27,104	4.74	19,705	3.48
June ¹	4,231	19,248	4.55	13,011	3.07

¹ New territory added.

Infected rats came from the following character of buildings:

Dwellings (inside, 3; in yards, 76).....	79
Food depots.....	202
Wharves.....	53
Open areas (dumps, cemeteries, gutters, etc.).....	106
Warehouses for the storage of nonfood products.....	65
Sheds or outhouses.....	17
Sewers.....	2
Stables.....	2
Miscellaneous buildings.....	53
Total.....	569

Of the number of infected rodents recorded from dwellings, all but three were captured in the yard of the premises, while of those listed from food depots all were taken from the interior of the buildings.

The premises from which infected rats were taken and in which human plague occurred were, on the whole, about the average in mechanical cleanliness and general appearance.

THE INTERRELATION OF RODENT AND HUMAN PLAGUE.

There has been direct evidence of intimate contact between human cases of plague and infected rodents. Human plague occurred in individuals that were employed either in the infected buildings or in adjoining premises. In three instances rodent plague was detected prior to human cases. There were many foci from which a large number of infected rats were taken and, despite the very heavy infection at these foci, no human cases of plague occurred.

The failure of human cases to develop in these instances may be explained by the selective habits of rat fleas. As long as their natural host is available the rat flea will usually adhere to it instead of attacking man, and for this reason plague will "go through" the rat population of an infected locality before it appears in man. The last few infected rats are the most dangerous. The dispersed fleas, unable to find available rodents, through necessity feed upon a less preferred host, as man or other animal.

As a routine measure in human plague both the patient's residence and his place of employment were at once fumigated with cyanide gas for rodent and flea destruction. Premises from which positive rats were recovered were immediately inspected upon receipt of such report from the laboratory. The treatment of the focus depended upon the character of the surroundings. If the premises consisted of open-areas little was done other than a general clean-up, elevation of any material stored thereon, intensive trapping, and, when practical, poisoning.

Buildings such as wholesale groceries, warehouses, rice mills, etc., to which human and rodent plague was traced were as soon as possible fumigated with cyanide gas for the destruction of fleas and the remaining rats. Intensive trapping was instituted at once in all cases and, when practical, poisoning.

Poisoned bait was not distributed in localities in which there was danger of poisoning human beings or live stock. The poison used was an arsenic paste smeared over bread which was cut in small cubes prior to distribution. In all, 250,558 pieces were placed.

The rat-proofing status of all buildings in infected areas was carefully investigated and such defects as found were ordered repaired.

Whenever rat harbors were suspected or determined to exist under nonrat-proofed structures, such as old broken floors, they were treated by exposing the rat harborage. In this work the demolishing squad and property owners removed 88,458 square yards of planking.

Whenever an infected rat was recovered from an open area, street, or gutter the following usually applied:

A. If a *norvegicus*—ground rat—intensive trapping in the immediate vicinity, making efforts to locate the focus, inspection of premises to locate rat harborage.

B. If a *mus rattus*, *alexandrinus*, or *musculus*—house rats—fumigation with HCN gas of food depots and warehouses in the immediate vicinity that indicated rodent infestation, intensive trapping, and inspection of premises.

The time of exposure in ship fumigation has been 1 hour and 15 minutes; in dwellings and small structures 2 hours; and in large warehouses where quantities of merchandise were stored overnight.

Briefly, the method of procedure for fumigating buildings in New Orleans was as follows:

The gas was generated in oak barrels placed in various compartments, the quantity of material necessary and the number of barrels required being computed at headquarters in advance. The cyanide required in each barrel was weighed out in the storeroom and tied up in ordinary gunny sacks. The sulphuric acid was measured and

placed in stoneware jugs. Barrels, cyanide, acid, paste, and paper were then conveyed to the structure that was to be treated.

When all openings in the structure were made gas tight and the barrels properly located, the proper amount of water was placed in the barrels, to which was added the proper amount of sulphuric acid. The required amount of cyanide was placed near the side of the barrels and, when all was completely ready, the cyanide was dropped in the barrel by hand, starting with the innermost barrel working toward the door, and the building quickly vacated and closed.

At the end of the period of exposure the structure was opened up for natural ventilation, supplemented by artificial means whenever necessary. Entrance to the building was not permitted until at least one hour had elapsed, and then only with due precaution. If evidence of gas remained this time was extended. Aboard vessels animal tests, in accordance with bureau general orders, were carried out, and all parts of the ship were visited by a trusted employee before others were permitted to enter.

Favorable results were obtained at the various foci by the application of the above-enumerated antiplague measures, and it is believed that fumigation was a highly efficient factor in the control of the infection.

A summary of fumigation operations at foci of infection follows:

Number of buildings fumigated with cyanide gas.....	318
Buildings fumigated for rodent foci.....	91
Buildings adjoining rodent foci fumigated.....	218
Buildings fumigated for the destruction of excessive rodent population.....	9
Pounds of cyanide used.....	36, 470
Pints of sulphuric acid used.....	52, 973
Number of rodents recovered after fumigation.....	4, 230
By species:	
<i>Mus norvegicus</i>	364
<i>Mus rattus</i>	1, 382
<i>Mus alexandrinus</i>	1, 611
<i>Mus musculus</i>	873
Number of plague rodents recovered by fumigation.....	98

TRAPPING.

The destruction of rats and the location of infected areas in a community depends principally on trapping. The extent and progress of the epizootic can only be determined by effective trapping correlated with laboratory examination. For this reason an efficient trapping force is of utmost importance in antiplague campaigns, and no effort has been spared in endeavoring to maintain a perfect organization. This organization of the field forces was patterned after service methods used in former campaigns.

The city was divided into four sections which, for the purpose of identification, were called trapping zones. Each trapping zone was subdivided into trapping districts, and each trapping district was again subdivided into trapping areas in which the individual trappers worked. A squad of trappers covering each district worked under the immediate charge of a foreman.

The extent of the territory assigned to each employee varied with the character and number of structures located therein. In the business section of the city trapping areas were smaller than those located in rural districts.

The chief trapper was placed in charge of the entire trapping force, assisted by four assistant chief trappers, each of whom had supervision over a trapping zone. The chief trapper, assistant chief trappers, and foremen saw to it that the trappers were on duty during working hours, that the traps were properly kept, placed, and baited. The foremen also kept a record of the daily catch of their squads, and advised trappers as to catching methods. The duties of the chief trapper and his assistants included checking up the work of the trappers and the foremen, adjusting trouble between trappers and property owners, maintaining discipline, and attending to such other miscellaneous duties as directed by the officers in charge of the division.

Up to June 30, 1920, there have been used approximately 25,000 snap traps, 2,000 cages, and 3,000 game traps.

The equipment of trappers varied, but in general consisted of a badge, 150 snap traps, 25 mouse traps, 25 game traps, a bucket, wire, and plain brushes; file, pliers, flash light, spiral leggings, memorandum book, indelible pencil, and an adequate supply of tags and envelopes. The number of the different varieties of traps and the articles of equipment intrusted to each employee differed on account of the character of territory to which the trapper was assigned.

Bread and bacon were chiefly used as bait. Trappers were paid a monthly salary and a bounty for each rat delivered to headquarters as follows: 25 cents for live rats, 10 cents for dead rats, and 5 cents for mice.

Vigorous action was taken against violators of any of the provisions of the rat-proofing law. Of 875 legal cases, 195 affidavits were withdrawn by the service on account of compliance before trial, 32 violators were convicted, and 648 cases are still pending.

Of special interest was the sanitary work accomplished near the water front by the dock board and the railroad companies. The Bienville Street Wharf, the Poydras Street Wharf, and the Sixth Street Wharf were rat proofed in five months, while work is still in progress at the Desire Street Wharf. Plans and specifications for the reconstruction of the Governor Nicholls Street Wharf, First Street Wharf and Celeste Street Wharf were submitted to headquarters and were inspected and passed. It is believed that the entire river front will be rat proofed before June 30, 1921, provided the present arrangements are not changed.

At the railroad property, with one exception, all of the warehouses now have concrete floors completed or nearing completion. The one exception above mentioned is the railroad property located along Press Street, for which work the financial arrangements are still being negotiated.

In most instances the temporary work previously accomplished at various cotton presses has now been changed to Class A rat proofing.

A summary of rat proofing operations follows:

Notices served.....	2,568
New buildings inspected.....	516
Number of premises inspected.....	24,316
Number of premises abated.....	2,378
By elevation.....	265
By marginal wall.....	247
By concrete floor and wall.....	465
By minor repairs.....	1,211
Total buildings rat proofed.....	2,188
Buildings demolished.....	190
Total buildings rat proofed to date.....	164,224

Character of structures.	Com- pletely rat- proofed.	Work started.	Total.	Square yards of concrete.	Linear feet of concrete wall.	Elev- ated.	Cost.
Main buildings, class A.....	194	53	247	88,835	26,280	.....	\$325,237
Main buildings, class B.....	784	569	1,353	.....	8,415	212	35,159
Sheds and outhouses, class A...	427	748	1,175	13,152	9,174	.....	34,687
Sheds and outhouses, class B...	973	482	1,455	.....	3,029	53	8,329
Total.....	2,378	1,853	4,230	101,987	46,898	265	403,412

PREVENTION OF THE SPREAD OF COMMUNICABLE DISEASES.

The ideal prevention of epidemics should be based upon early reporting of cases; that is, reliable prompt morbidity reports. Unfortunately morbidity reports are so meager or unreliable that many health departments are compelled to use mortality statistics as a basis for action. Obviously such action is too late to constitute real prevention. The obligation to prevent the spread of communicable diseases from one State to another is placed upon the service by Congress with the understanding that State and local machinery must be utilized in so far as possible. The service policy is therefore to build up a strong division of communicable disease control in each State health department rather than to expand the Federal activities within the States. Service aid is rendered in communicable disease control with this policy clearly in mind.

ARKANSAS.

At the outset of the work in Arkansas, the purpose of the detail was outlined to the State health officer under the following heads:

1. Establishment of endemic index.
 - (a) Increase of morbidity reports.
 - (b) Use of records of reported cases of reportable diseases.
2. Investigation and control of epidemics.

It was learned from the State health officer that no records of morbidity reports made prior to January 1, 1919, had been kept. From personal observation it was found that morbidity reports being made represented only a very small per cent of the actual cases.

As the establishment of an endemic index was entirely dependent upon the morbidity reports, an effort was made throughout the year to instruct the various city and county health officers in this matter and to inform as many of the practicing physicians as possible. For the above purpose 50 counties and 93 cities were visited.

The following epidemics were investigated:

Disease.	Location.	Number of cases.	Duration in days.	Findings.
Diphtheria.....	Argenta.....	11	18	Contact.
Do.....	Carthage.....	6	43	Do.
Do.....	Pocahontas.....	34	115	Do.
Dysentery.....	Antoine.....	52	21	
Pellagra.....	Nettleton.....	11	180	Dietary.
Smallpox.....	Sebastian County.....	27	60	Contact.
Do.....	Perry.....	4	30	Do.
Do.....	Dierks.....	25	60	Do.
Do.....	Foreman.....	12	75	Do.
Do.....	Foulke.....	12	80	Do.
Do.....	Montgomery.....	15	30	Do.
Typhoid fever.....	Argenta.....	7	75	Do.
Do.....	Carthage.....	7	120	Surface wells.
Do.....	Clarendon.....	8	44	Water supply.
Do.....	Rural, near Des Arc.....	8	116	Surface wells.
Do.....	Forrest City.....	6	13	Well contaminated by broken sewer.
Do.....	West Fork.....	4	30	Surface wells.
Do.....	Wilson.....	5	30	Ice cream.
Sore throat.....	Graysonia.....	150	40	Contact.

GEORGIA.

The work in Georgia has been twofold—first, the study and control of epidemics and, second, a study of the method of reporting communicable diseases and an effort to improve the same.

Morbidity statistics had been collected in part during 1918 and were handled by the division of rural sanitation and epidemiology. The reports were tabulated according to counties and filed daily. No weekly or monthly compilations were made except in those counties having a full-time commissioner of health. Reports were far from satisfactory. It was realized that before any indices could be established a more accurate method of reporting must be adopted.

During the year 36 visits to various sections of the State covering over 7,000 miles have been made to investigate 10 outbreaks of diphtheria, 7 of smallpox, 3 each of meningitis and malaria, 2 of typhoid, and 1 each of dysentery, tuberculosis, and lethargic encephalitis. In addition to the above 5 conferences concerning health matters have been attended. Grand juries were addressed on three occasions for the purpose of urging upon them the adoption of the Ellis health law for their respective counties.

The law requiring the reporting of communicable diseases in Georgia is very incomplete.

On August 17, 1914, a law was established creating a county board of health in each of the counties of the State, two members of said board having membership by virtue of their offices. The third member of this board was to be elected by the grand jury upon its next session after the passage of said act. Not more than 50 per cent of these county boards have been completed so far.

In an effort to assist the county boards of health a circular letter was addressed to every physician of the State early in January calling attention to the incompleteness of the reports for the calendar year 1919 and urging the necessity of thorough cooperation with the State board of health to assist in the control of preventable diseases. Letters were also addressed to all the county superintendents

of schools who, according to law, were members of the county board of health, inviting their attention to the law of 1914 and requesting action in case their board had not been completed. Letters were also addressed to mayors of the cities and towns of the State requesting information as to their boards of health. Only a fair proportion of these letters were answered.

The reports received during the months of February, March, April, and May were compiled by counties and congressional districts and a copy sent to the county and city boards of health, to newspapers of the State, and to all physicians in those counties making no reports. These reports carried a letter urging upon the health officials and the physicians the necessity of accurate and complete reporting. In addition the April report was sent to every physician in the State.

There were reported during the year ending June 30, 59,777 cases of communicable diseases, 36,251 of which were influenza. Influenza cases omitted, there were 12,280 cases reported during the six months January 1 to June 30, 1920, as against 11,346 for the preceding six months July 1 to December 31. It is apparent that efforts to arouse interest among the physicians of the State have resulted in practically no increase in the number of cases reported. This lack of reports was evident from the first. It was felt that reporting could never be satisfactory or materially improved unless more adequate health regulations are provided.

In the 17 counties of the State having full-time commissioners of health reports have been better than in the other 138 counties, but even in these they have been incomplete.

In view of the above, a tentative bill was drawn fashioned after the model morbidity law and presented to the State health officer with the recommendation that an effort be made to have the same enacted into law at the session of the general assembly convening in July.

INDIANA.

After studying the methods in use in this State relative to the collection of morbidity reports, it was evident that in order to establish an endemic index for exercising a reasonable check on the prevalence of disease it would be necessary to secure better and more prompt reports from the reporting units, since heretofore they were not received until the end of each calendar month. The reports were of value in ascertaining in which district unusual cases occurred, but of little value in abating an epidemic, as in most cases the peak was passed before the epidemic was brought to the attention of the local health officer or State epidemiologist.

In view of this system monthly reporting was changed to a weekly reporting system by means of a regulation passed by the State board of health.

All county, city, and town health officers shall immediately copy into their transmissible disease record book all reports of smallpox, diphtheria, membranous croup, scarlet fever, measles, epidemic poliomyelitis, cerebrospinal fever, influenza, pneumonia, tuberculosis, typhoid fever, chickenpox, and whooping cough. Every Saturday the original transmissible disease reports received by all county and city health officers during the previous seven days shall be sent to the Indiana State Board of Health, along with a weekly prevalence card, giving the number of each transmissible disease known to the health officer to be present within his jurisdiction. Health officers must send their weekly pre-

valence card along with the original transmissible disease reports received during the previous seven days to the county health officer having jurisdiction not later than Thursday of each week. The weekly prevalence card must be sent to the Indiana State Board of Health by the county and city health officers and to the county health officer by the town health officer, even if there are no transmissible diseases to report, stating this fact.

Pursuant to the passage of this rule the health officials in each district were appointed as assistant collaborating epidemiologists of the service and franked mailing cards were furnished these officials upon which physicians in their district reported communicable diseases. The inauguration of this system has been of great assistance in the reporting of contagious diseases. It is second only to personal interviews with physicians and conferences with medical societies in producing results. A total of 7,470 reports were received from October, 1918, to May, 1919, in contrast to 29,659 for the period October, 1919, to May, 1920.

An accurate check is kept on each reporting unit. Units whose reports are delayed are notified at once. This has been a decided stimulus to the reporting. At the present time there are two counties that are not reporting regularly, namely, Washington and Floyd Counties.

An index has not been established for two reasons—first, an index based on previous reports would be of little value and would necessarily have to be changed each month with the receipt of better reports; second, the data for an endemic index is not available for more than two years.

During the year the following epidemiological work was performed: Diphtheria, Richmond, Winamac; typhoid fever, Laporte, Greenfield, Logansport, Andrews, Veedersburg; smallpox, Williamsport, Linden, Monticello; sanitary survey, Thorntown, Industrial Village, Orphan Home, Hammond, Greencastle.

Lectures were delivered at Indiana University concerning epidemiology, vital statistics, and school hygiene.

LOUISIANA.

The service officer assigned as epidemiologic aide to Louisiana was detailed shortly after to New Orleans to assist in the plague eradication work there.

MARYLAND.

Upon being detailed to Maryland, the service epidemiologic aide held a conference with the State health officer. Although rather reliable morbidity data were available for the 11-year period 1908 to 1918, tabulations by disease, county, and month had not been made. Such tabulations were made at once.

The data for Baltimore City available at the State department of health were not sufficiently complete to permit proper tabulations. The county tabulations were completed during September. The calculation of the endemic index showing an endemic numerical standard for each disease, county and month, was completed in November and submitted to the State health officer for approval.

Due to a change in personnel in the bureau of communicable diseases it was not possible to apply the endemic index as a part of the

routine of this bureau until January 1, 1920. Since that time it has been in use continually as a standard of county and State endemicity with very satisfactory results. A clerk was assigned to keep a daily record of morbidity reports, comparing current reports with the endemic standards. These daily tabulation sheets were arranged in such a manner as to show not only the date of occurrence, but the exact location of reported cases. In this manner, this clerk is able to immediately notify the chief of the division of communicable diseases not only concerning undue morbidity, but its location or locations.

Sufficient data concerning the accuracy and value of the endemic index in Maryland have already been obtained to show that, with the exception of typhoid fever, it is a much more reliable indicator of endemicity than the actuarial method, which has been used by the State department of health. It has an important additional advantage in that it shows endemic standards not only for the State—exclusive of Baltimore City—but for the individual counties as well. Morbidity reports for the entire year of 1919 and the first six months of 1920 have already been plotted against these indexes. The comparison of the index and incidence curves appears to be rather satisfactory. The indexes are apparently in need of corrections of only small magnitude, with the exception of those for typhoid fever. These must be corrected sharply downward, due to the steady decline in typhoid morbidity in counties of Maryland in the past 10 years. The discrepancy in the indexes for typhoid fever is on account of the undue influence of the greater number of typhoid cases in former years, as compared with latter years, in the calculation of these indexes. It is believed that when the figures have been obtained for the remaining months of 1920, the typhoid indexes can be corrected to rather an accurate degree, either by arbitrarily making a horizontal decrease in all typhoid indexes, or by taking a five-year median including the figures for the last two years.

The endemic index is also being used in the field by the State district health officers and by quite a few county health officers. Their reports of its use, so far, indicate that it has a distinct value in their routine field work.

Weekly telegraphic reports were not attempted until it was considered probable that these reports would be adopted as a routine measure by the bureau of communicable diseases. On January 1, 1920, these reports were begun and have been continued since.

On November 20, in response to a request from the State health officer, temporary headquarters were established at Hagerstown for field duty in Washington County. This section, although one of the richest in the State, shows much higher endemic indexes for several of the more important communicable diseases than the State average. Washington County has a population of approximately 60,000; its total taxable basis is over \$47,000,000; its largest town, Hagerstown, has a population of over 28,000, with taxable basis of over \$19,500,000. The county health organization consists of a part-time poorly paid county health officer and one old man, who is employed to carry out fumigations. Hagerstown has no city health officer, consequently the responsibility of this office devolves upon the county health officer.

Hagerstown has two health ordinances administered by the chief of police. One is an inadequate milk ordinance and the other a nuisance ordinance. The milk samples are examined by a bacteriologist who is the owner of a biochemical laboratory.

The citizen's health committee of Hagerstown, a group of representative business and professional men, has endeavored to better the health conditions since organization in 1917. A campaign for a city health department was conducted in May, 1919, with no results. The Washington County Public Health Association has maintained a public-health nurse in Hagerstown and Washington County for the past seven years. Through this nurse practical demonstrations of local health needs were made. In the 1920 campaign for funds public approval was granted this association by a subscription of over \$5,000. After joint conferences with the citizen's health committee and the service officer the association established tuberculosis and baby welfare clinics and employed an additional public-health nurse. Efforts to establish a joint health department for the city and county resulted in the voting of a city budget of \$1,950 and a county budget of \$2,350. Although these appropriations are too small for adequate health protection, yet with their aid efforts are to be made to arouse public sentiment to the need for larger sums. Already clinics for diseases of the ear, nose, and throat and for dental work have been arranged.

Upon request the service officer acted as chairman of the Red Cross health committee in Washington County to investigate local health conditions relative to making definite recommendations for their improvement.

A demonstration in plotting the exact location of communicable diseases reported in Frederick and Washington Counties has been conducted, the "block system" being used instead of spot maps. County geological maps laid off in blocks, approximately $4\frac{1}{2}$ by 6 miles, are used; each of these blocks are subdivided into nine smaller blocks, which are lettered from A to I. In the field office daily records are kept as to the location of cases by block number and letter, together with case numbers and dates of occurrence. This record requires one tabulation sheet for each disease for the two counties each month. Chronological and geographical relationships are apparent at a glance. This method not only furnishes valuable current information, but provides permanent records for future use in the location of endemic foci.

During January, February, and March 26 cases of smallpox were investigated at Hagerstown. The primary source of infection of the first two cases could not be ascertained. The primary source of infection for the remaining series of cases was an unreported case of smallpox in the person of a railroad brakeman, whose run was between Hagerstown, Md., and Shenandoah, Va. This man apparently contracted smallpox from a case at Shenandoah, with whom he had been closely associated. This information was forwarded to the State health officer of Virginia. Three additional cases appeared in the home of this brakeman in Hagerstown. All the cases were mild, and none were reported.

A young white woman, who was called in to nurse one of these cases, contracted the disease, and was the first reported case. Contacts

with these patients had been so numerous that they themselves had no idea as to the number, and before the epidemic could be controlled it was necessary to examine between 1,200 and 1,300 known contacts of secondary cases and resort to wholesale vaccination. During the investigations several interesting cases of suspected variolous eruption was seen, also one aspirin eruption, one bromosis, and one case of eczema complication chickenpox.

On May 19 a request was received from the State health officer to proceed to Ocean City, Md., to assume charge of control measures in a smallpox outbreak. Twelve cases had been reported from this town, which is a summer resort with a constant population of about 1,000 persons. It was learned that about 5,000 summer visitors stop at Ocean City for varying periods each season. Since the season was about to open the situation was very serious. A compulsory vaccination ordinance was quickly passed and assistance was rendered the local health officer in the vaccination of the entire population of the town. No new cases developed following this campaign. Epidemiologic data obtained indicated that the source of infection in these cases was Sussex County, Del.

Ten typhoid investigations have been conducted during the year, and the following sources of infection were indicated by the epidemiologic and bacteriologic evidence obtained:

1. Three chronic carriers, all white women. They gave definite history of typhoid fever, in one case one year ago, in another three years ago, and in the other 17 years ago. All three carriers showed typical bacilli in the feces, the bacteriological examinations being made by the State bacteriologist of Maryland.

2. Two polluted water supplies.

3. One out-of-State contact (Mechanicsburg, Pa.).

4. One contact with an unreported case of typhoid on a dairy farm.

5. Three incorrect diagnoses: (a) Post operative sepsis; (b) acute articular rheumatism; (c) pertussis complicated by a heavy infection with *ascaris lumbricoides*.

Investigation of the past history of the typhoid carrier mentioned above, who had typhoid 17 years ago, shows that she probably has been the source of infection in 15 cases of typhoid fever occurring over a period of years, at Romney, W. Va., where she kept a boarding house. This information was received through the city health officer of Cumberland, Md., which is at present the place of residence of this woman.

In December, 1919, a scarlet fever investigation was conducted at Hood College, located at Frederick, Md. A student of this college had developed a typical case. The local health officer allowed 315 students to return to their homes without any physical examination or other precautionary measures. The addresses of these students were forwarded to the State health officer. It was found necessary to notify the State health officers of 11 other States in whose jurisdiction students of this college resided. No information was received concerning secondary cases among the students, if any such did develop.

In February a similar incident occurred at St. James College, St. James, Washington County. In this case the principal closed the school before the arrival of the local health officers. The students,

65 in number, were allowed to return to their homes without physical examination or other precautionary measures. The State health officer considered it advisable to notify the State health authorities of 10 Eastern States in whose jurisdiction students of this school resided. Information was received concerning only one secondary case. This case developed in a student of the school who had returned to his home in Essex County, N. Y. It is understood that other sources of infection had been eliminated in the investigation of this case by the New York authorities.

Two other scarlet fever investigations were made in order to clear up the diagnosis in three suspected cases. Two of these cases had typical scarlet fever. The remaining case, from epidemiological and clinical evidence, was diagnosed as German measles.

Two diphtheria investigations were made during the year. In the first it was found that the father of a large family was a chronic carrier of virulent diphtheria bacilli. In the course of three months there were six cases in this family with three deaths. The first fatal case, a boy 5 years of age, did not receive medical attention until about 72 hours after the onset. The other two fatal cases were twins 11 months of age and both marantic; they died in spite of large doses of antitoxin. The carrier was isolated for over two months before a series of negative cultures could be obtained. His tonsils were markedly diseased, and it was inferred that their condition was the cause of his carrying diphtheria bacilli; he refused to have his tonsils removed.

The remaining investigation showed eight cases of suspected diphtheria in one family at one time. The primary source of infection in this case was not learned. The clinical appearance of these cases, together with the absence of any marked temperature, indicated Vincent's angina. Repeated bacteriological examinations showed diphtheria bacilli and streptococci, but no spirilla or fusiform bacilli. About two weeks after the original investigation one patient, a little girl 3 years of age, developed vulval diphtheria and died in spite of large doses of antitoxin. All the other cases recovered.

One case of suspected poliomyelitis was investigated in May. This child, 3 months of age, did not show clinical evidence of poliomyelitis. The history and examination of the case indicated general convulsions of intestinal origin, complicated by a cerebral hemorrhage as the cause of spastic weakness present in the right arm and leg. Subsequent history tended to substantiate this conclusion.

Two bills were introduced in the Maryland Legislature—in session during January, February, and March, 1920—which had a bearing on local health organization. One, known as the "town bill," authorizing modern health organization in cities and towns of 10,000 population and over, where charter provision does not already authorize such organization, was passed by the legislature.

The other bill, known as the "county bill," was intended to remove antiquated restrictions on county health organization and to authorize payment of salaries sufficiently large to employ full-time county health officers. This bill failed to pass.

Arrangements have been made recently for detailed interstate notification between the State of Pennsylvania and the State of Maryland, which so far have proven very satisfactory. It has been found

that certain sections of this State, particularly those where dairying is an important industry, are, unless very carefully watched, potential sources of danger to consumers in adjacent districts and States. The city of Washington, for instance, is a large consumer of milk produced in a district in Frederick County, which appears to be a chronic scarlet-fever focus. The same condition applies to Baltimore City.

Due to the unsatisfactory condition of communicable disease regulations in the State of Maryland, the report of the American Public Health Association committee on standard regulations concerning control of communicable diseases (Reprint 435 P. H. R., Oct. 12, 1917) was submitted to a conference of deputy State health officers in January. Some of the deputies had already used this report for reference. Regulations drawn up in such legal form as to be effective under the provisions of the Maryland law, and at the same time embodying the principles set forth in the above-mentioned report, were prepared by the chief of the bureau of communicable diseases and the department attorney. These regulations will be published in the near future as communicable disease regulations of the State department of health.

MASSACHUSETTS.

The service epidemiologic aide for Massachusetts commenced active work in October. Upon investigation of the division of communicable diseases it was found that the local health agents who are in direct communication with the health conditions of the people are in too many instances men without any medical education or sanitary training. The department has only advisory control over the appointment of these health agents.

To increase the cooperation between these agents and the State board of health, the board has appointed eight district health officers in eight districts comprising the State. These men establish relations with the agents in their respective districts and stand ready to assist or advise whenever called upon. They form a link connecting the activities of the local departments with the State department of health, with charitable and industrial organizations, health leagues (such as the antituberculosis and child welfare leagues), and all other health workers. They have an extensive work which prevents them frequently from making detailed investigations of small local outbreaks or interesting cases which so often are the forerunners of epidemics. The district health officer occasionally meets with difficulty where an investigation involves some other district or State. It therefore seemed appropriate and advantageous to have an officer who could be called upon at any time for such investigation in any or all parts of the State or adjoining States. Such a position could best be filled by the service officer.

Attention was directed to diphtheria, which seemed to have too high an endemicity. Especially was this true in the Connecticut Valley district, which was at that time without a district health officer. For this investigation headquarters were moved to Springfield to be on the ground and yet available for special duty as if in

Boston. So far studies of diphtheria have been completed in Belcher-town, Chicopee, and Westfield.

At the same time as these diphtheria studies, lectures and addresses on health matters were delivered before various organizations. Investigations were made concerning a smallpox case necessitating a trip to New York City and a conference with the service officer in charge of Ellis Island; a cerebrospinal meningitis case in an immigrant, necessitating a trip to Providence, R. I., and conferences with the service officer there and the State health officer; an anthrax infection, due to a shaving brush, involving a trip to New York City to inspect the factory loft and conferences with the State and city health departments; and a mosquito survey of Provincetown, Mass., with a view to their possible eradication.

It seems probable that in the future there will be more calls for such investigations, especially those which will involve other New England States. It is expected that through such work even better cooperation between the health departments of these States and Massachusetts may result.

MISSISSIPPI.

The service officer assigned as epidemiologic aide to Mississippi was detailed shortly after to New Orleans to assist in the plague eradication work there.

OHIO.

Upon assumption of duties as epidemiologic aide in July, 1919, about 2,300 health officers were found. The Hughes act, which became a law on April 17, 1919, contemplated the replacement of this large group of health officers by a smaller number, not over 160, of well qualified full-time officials, appointed under the civil service and assisted by one or more nurses, clerks, etc. The State organization, under this law, which was to become operative January 1, 1920, was nearing completion when on December 18, 1919, the Hughes act was amended by the Griswold act. This removed the civil-service requirements of the Hughes act, made optional the employment of full-time health officers, removed the requirement that they be physicians in the case of cities, made optional the employment of public-health nurses, etc. These changes and others made necessary in the creation of city and general health districts so altered conditions as to cause considerable confusion and delay in the appointment of health officers. Since January 1, however, appointments have been made from time to time until at present there are 147 health commissioners. Only five counties and one city are without health commissioners. Of the present commissioners 143 have been appointed as assistant collaborating epidemiologists.

Endemic indexes based on the monthly reported cases for the preceding five years were established for typhoid fever, diphtheria, scarlet fever, measles, whooping cough, and smallpox. These were prepared in graph form showing the minimum, median, and maxi-

num number of monthly reported cases for the 80 cities of Ohio. These indexes have not been kept in operation due to lack of personnel in the statistical division.

A plan for the establishment of endemic indexes in the offices of the various commissioners of health has decided advantages. As soon as the routine of these various offices is running smoothly this matter will be taken up with the State department of health to have a few of the counties and cities install such indexes.

Epidemiologic investigations were made in the State as follows: Outbreaks of typhoid fever at Warren, Lima, Richwood; of dysentery at Spencerville; food poisoning at Columbus and Mansfield; botulism at Alliance and Canton; scarlet fever at Lancaster; smallpox at Mansfield; milk sickness at West Salem; diarrhea at Hillsboro; the milk situation at Lima; and the typhoid situation at Alliance.

Considerable laboratory investigations were made of botulism from canned ripe olives and *Eupatorium Ageratoides* as a cause of milk sickness.

WISCONSIN.

The efforts in Wisconsin were directed almost entirely toward improving the methods of communicable disease control. It was recognized that complete morbidity registration, which affords local, State, and Federal health departments the opportunity of knowing "when, where, and under what conditions communicable diseases are occurring," is a prime factor in controlling these illnesses. Consequently it was the constant endeavor to stimulate the notification of disease and provide means of visualizing the results.

The Wisconsin statutes governing health activities are strong, but require more vigorous enforcement to afford a great measure of protection.

A study made of past and present reports of communicable diseases resulted in the establishment of medium endemic indexes based upon monthly reports collected since January, 1914. It was then deemed necessary to devise a means of displaying these points graphically as well as indicating the total number of cases of each disease reported monthly.

Drs. Hitchcock and Carey of the Massachusetts State board of health described a method whereby indexes and total cases could be displayed on clock dials, the hands of the clock being used to indicate these points. (See the *American Journal of Public Health*, p. 355, May, 1919.) The use of the thermometric device for representing the number of reported cases in Wisconsin is an adaption of the clock dial method.

In addition to the establishment of endemic indexes, other means of graphically representing collected information were devised.

1. Comparisons were made of annual death rates per 100,000 population for communicable diseases occurring in the State of Wisconsin and the registration area of the United States. When these data were recorded graphically it was discovered that the death rates in Wisconsin with the exception of scarlet fever were invariably lower than for the registration area.

2. By means of a series of colored charts the number of cases of each communicable disease reported from the city of Milwaukee and the remainder of the State were compared. It was found that nearly as many cases were reported from Milwaukee as from the remainder of the State. The seasonal prevalence of the diseases was especially well known.

3. While the "indexometers" gave a fair conception of the current monthly prevalence of communicable diseases it was felt that there was need of showing how many cases were being reported from specified localities in the State. Accordingly there was prepared a large board on which the names of the places reporting the number of cases notified could be placed beneath each of the principal communicable diseases. This bulletin board served to keep the entire central staff of the State board of health posted with regard to the extent and location of these illnesses.

4. Charts showing the monthly endemic median indexes of mortality and morbidity were likewise prepared and compared. These charts showed that more deaths than cases of pulmonary tuberculosis and cerebro-spinal meningitis were reported, while other diseases were relatively incompletely reported.

The necessity for improved morbidity registration having been demonstrated, especially in so far as the practicing physicians were concerned, attempts were made to arouse the medical profession to a realization of its responsibilities. Three articles dealing with this subject were prepared and published in the Wisconsin State Medical Journal, which reaches practically the entire profession in the State. The titles of these articles were:

1. "High Fatality Rates of Communicable Diseases; an Indication of Incomplete Morbidity Registration in Wisconsin," December, 1919.

2. "The Need for Improved Morbidity Registration in Wisconsin," January, 1920.

3. "Health by Mail; A New System of Communicable Disease Control," February, 1920.

Four speakers appeared before the following county medical societies and discussed various phases of public health administration: Ashland, Bayfield, Iron; Barron, Polk, Washburn, Sawyer, Burnett; Chippewa; Dane; Eau Claire; Douglass; Jefferson; LaCrosse; Pierce; Price, Taylor; Racine; Rusk; St. Croix; Trempeleau, Jackson, Buffalo.

In order to illustrate the manner in which the records are visualized in Madison a small working model of an "indexometer" was shown at the meetings, while samples of the report cards were distributed among those present. The society meetings were usually well attended.

Ten audiences of school children and women's clubs were addressed on "The methods of controlling communicable diseases."

At the request of the State health officer the service officer was designated as representative of the State board of health to serve as a member of the sanitation advisory committee to meet with the sanitary engineer of the industrial commission. This committee held five meetings for the purpose of formulating rules for enforcing the new State law which makes occupational diseases compensable. Rules covering the ventilation of work places were adopted and other phases of industrial hygiene discussed.

In order to reduce, if possible, the infant mortality in the State, three pamphlets of the "Keep well" series issued by the service; "Breast Feeding Her Baby," "Bottle Feeding Her Babies," "Motherhood," were sent to each mother in the State when the birth of her child had been reported to the State board of health. With the booklet was sent the usual certificate of birth registration. One thousand Public Health Service reprints, "Control of Communicable Diseases" were issued to health officers and physicians in the State.

Ten articles dealing with the prevention and control of smallpox, scarlet fever, measles, whooping cough, and similar subjects were prepared for publication in newspapers. Forecasts of disease prevalence and reviews of past disease occurrence were also prepared and published. A number of articles were prepared for the quarterly bulletin of the State board of health.

Studies were made of an outbreak of diphtheria in Argyle and diarrheal affection in Lone Rock and Hayward.

As an aid in securing more complete morbidity registration the service plan of using franked post cards for reporting communicable diseases was put into operation. Cards for submitting weekly summaries were sent to 1,500 local health officers in communities having less than 750 population each. Approximately 200 additional health officers in places having more than 750 population were appointed assistant collaborating epidemiologists in the Public Health Service. In the latter localities physicians are required to report to the health officer on the individual case cards while the health officer submits the usual weekly summary to the State health officer in Madison. After the local health officers have transcribed the information from the physicians cards the cards are forwarded to Madison for compilation and study.

In so far as the improvement of morbidity registration in Wisconsin is concerned definite results have been achieved. The "indexometers" show that the total number of cases of smallpox, chickenpox, measles, and whooping cough have consistently exceeded all previous records, while considerable increases in other disease have likewise been recorded. This does not necessarily imply that there has been an increased prevalence of these diseases but rather that more complete reports have been forthcoming.

At present the activities are as follows:

1. Weekly summaries of cases of communicable diseases are received from approximately 1,000 local health officers.

2. The number of cases of each communicable disease are recorded on a chart. Subtotals are also kept and the chart is renewed monthly.

3. The "indexometers" are moved each day to record the additional cases reported during the day.

4. A pin chart is kept to show the number of cases and places from which communicable diseases are reported.

5. A graph is kept to show the weekly number of cases of communicable diseases reported from the city of Milwaukee alone and from the remainder of the State.

6. Individual reports of communicable diseases received from physicians in 17 principal cities of Wisconsin are tabulated and studied.

7. The number of cases of communicable diseases occurring in counties, by cities, villages and townships therein, are compiled and transferred to a bound book which serves as a permanent record.

8. Weekly detailed reports of the number of cases and locations of cases are prepared and sent to deputy State health officers.

9. A weekly telegraphic report is prepared and sent to the Surgeon General of the Public Health Service.

10. Monthly summaries of communicable diseases are prepared and forwarded to the Public Health Service.

11. Special reports on poliomyelitis are secured from physicians and forwarded to the Public Health Service.

12. Special charts are prepared and data secured for public health speakers and other persons desiring specific information.

CONTROL OF INTERSTATE WATER SUPPLIES.

The policy of utilizing existing State machinery for control of water supplies used in interstate traffic was followed during the year. The obligation to examine and certify these supplies is placed on the service by Congress, but to avoid duplication of work it seems wise to encourage and develop sanitary engineering divisions in States to the limit of their possibilities for furnishing the basic data for the certificates.

Where State engineering machinery does not exist, or is inadequate, service assistance has been given so that a double service has been rendered; the necessary data upon which to base certificates of quality have been secured, and divisions of sanitary engineering have been established or strengthened in such States.

The great majority of municipal supplies are used by interstate carriers and hence come under service jurisdiction. As a result the check maintained results in correction of defects and improvement in nearly all water supplies.

The certification of the purity of water provided for drinking and culinary purposes by common carriers engaged in interstate commerce has been carried out during the year with encouraging success in accordance with the revised procedure adopted following approval by the State and Territorial Health Officers' Conference, June 4, 1919. The experience of the past year has shown definitely that recent modifications in the administration of the certification plan tend to more effective cooperation of the State boards of health with the United States Public Health Service.

The procedure inaugurated at the commencement of the fiscal year includes the following main provisions:

1. The railroad officials, who are intrusted with the responsibility of selecting suitable water supplies and providing equipment for handling the water, are required now to direct a request semiannually, in January and July, for the certification of water supplies to the Surgeon General of the United States Public Health Service and to the State health officer having immediate jurisdiction.

2. Only State health authorities are recognized in cooperating in the supervision of these supplies by furnishing data for the preparation and issuance of the certificates to be approved by the Surgeon General.

3. Provision is made for greater elasticity with varying classes of supplies in the requirements for detailed field surveys and comprehensive analytical tests for deciding upon the safety of a water supply. Because of these changes in the form of the certificate, the data on water supplies obtained by the States can be noted thereon.

4. Provision was made in January for the issuance of temporary provisional certificates permitting tentative use by the common carriers of water supplies where the major sanitary requirements for safe water are fulfilled yet, because of certain minor details, improvements are necessary to remove some possibility of pollution.

The supervision exerted by the United States Public Health Service in cooperation with the State boards of health over water supplies used in interstate traffic has been productive of three important features.

1. Material aid is frequently furnished the States in the supervision of local water supplies. The extent of this aid can be estimated roughly by the fact that 72 per cent of the supplies requiring certification are used locally.

2. Assistance is rendered a majority of the States of the establishment of more adequate control over the water supplies through this cooperation. This has been repeatedly emphasized to the Public Health Service in correspondence from the State health officers and from acknowledgments made in the reports of the State boards of health.

3. The cooperation of the States has involved considerable extra effort and time of the State board of health engineering and laboratory forces. In certain instances the extra activities incurred by the State forces have appeared unwarranted as State functions.

These considerations have shown that it will become increasingly necessary, until the State supervision of public and private water supplies is much further developed throughout the Nation, for the Public Health Service to extend its forces in the supervision of water supplies entering into interstate commerce. Aside from the responsibility of the service for the safety of drinking water supplied the traveling public, the intensive activities in the certification of interstate supplies will be of great value to the various States in the development of local expert supervision over public water supplies.

When it is seen that certificates are required for 4,673 places where water is used for interstate purposes as reported during the year, and only 50 per cent have been certified covering the sanitary status of the water supply, it is realized that much is yet to be accomplished in this field.

Of 2,354 certificates issued during the year 2,111, or 90 per cent, certified the supply meeting the required standards of purity.

As in preceding years, in every case where a supply is reported as failing to meet the required standard of purity, except when temporary provisional certificates are issued, the use of the supply for drinking or culinary purposes in interstate traffic is immediately ordered discontinued, and appropriate placards placed.

The following table summarizes by States the statistics concerning the certification of these water supplies:

State.	Sources of water supply.				Number of railroad supplies.	Per cent of railroad supplies certified.	Certificates.		
	Municipal.	Private.	Railroad companies.	Total.			Supply satisfactory.	Supply polluted.	Delinquent.
Alabama.....	28	6	7	41	70	61	40	3	27
Arizona.....	23	3	27	53	56	13	6	1	49
Arkansas.....	45	3	22	70	97	43	35	7	55
California.....	56	6	18	80	116	64	71	3	42
Colorado.....	31	1	13	45	71	2	2		69
Connecticut.....	17	1	1	19	27				27
Delaware.....	6			6	13	69	6	3	4
District of Columbia.....	1			1	12	68	8		4
Florida.....	56	3	27	86	119	41	49		70
Georgia.....	70	2	11	83	162	40	62	3	97
Idaho.....	27	1	20	48	60	50	19	11	20
Illinois.....	58	7	25	90	177	81	129	15	33
Indiana.....	48	1	31	80	155	34	48	4	103
Iowa.....	45	3	23	71	117	76	63	26	28
Kansas.....	64	5	26	95	136	76	98	5	33
Kentucky.....	32	6	19	57	84	58	36	13	35
Louisiana.....	39	1	27	67	114	12	14		100
Maine.....	70	9	16	97	114	88	99	1	14
Maryland.....	19		11	30	49	86	37	5	7
Massachusetts.....	42		2	44	64	31	20		44
Michigan.....	66	11	34	111	198	45	77	13	108
Minnesota.....	35	11	30	76	120	42	41	9	70
Mississippi.....	25	1	15	41	62	26	16		46
Missouri.....	30	3	36	69	136	35	46	1	89
Montana.....	19	2	6	27	34	82	27	1	6
Nebraska.....	25		27	52	80	85	55	13	12
Nevada.....	10		9	19	21	57	12		9
New Hampshire.....	28	2	4	34	36	81	29		5
New Jersey.....	38		6	44	76	94	66	5	15
New Mexico.....	9	2	12	23	25	40	10		184
New York.....	99	8	37	144	220	16	36		58
North Carolina.....	50	5	11	66	100	42	42		22
North Dakota.....	20	6	20	46	81	73	43	16	50
Ohio.....	70	5	16	91	219	77	152	17	49
Oklahoma.....	30		31	61	85	41	25	11	47
Oregon.....	42	2	19	63	82	43	34	1	160
Pennsylvania.....	134	12	66	212	290	45	118	12	4
Rhode Island.....	4		4	8	12	67	8		42
South Carolina.....	36	3	11	50	67	37	24	1	36
South Dakota.....	18	1	17	36	48	25	12		32
Tennessee.....	27	5	16	48	94	66	48	14	149
Texas.....	90	6	81	177	296	49	143	4	11
Utah.....	11		3	14	19	42	8		4
Vermont.....	20		2	22	31	88	25	2	41
Virginia.....	49	3	24	76	118	43	73	4	90
Washington.....	35		40	75	121	26	31		33
West Virginia.....	28	6	17	51	73	55	32	8	59
Wisconsin.....	41	15	20	76	98	39	28	11	10
Wyoming.....	8		7	15	18	44	8		
Total.....	1,874	167	947	2,990	4,673	50	2,111	243	2,319
Average.....	38	3	19	61	95		43	4	47

As it has been recognized that the most effective method for improving the control over water supplies used in interstate traffic is to aid the States directly in properly supervising all water supplies of public import, the available means for furnishing such assistance by the service have been utilized to the utmost. Furthermore, the establishment and development of strong divisions of sanitation for the control of water, sewage, and other public-health engineering problems is, together with the development of State communicable-disease divisions, the most potent means to-day at the disposal of the Federal Government for the prevention of interstate spread of disease.

Very largely as a result of the recent activities of the service in this field, new sanitary engineering divisions have commenced to function in the supervision of sanitary works in eight States where

none had been functioning previous to November. In a number of other States the activities of these divisions have become more effective through the cooperation of the Federal bureau. With energetic support of these activities by the Public Health Service, the possibilities of nation-wide sanitation will within a decade become realizable in this country.

During the fiscal year the Public Health Service gave direct aid to 11 States by furnishing the services of trained sanitary engineers to build up the engineering work of the State health departments. As the demands for this work were numerous, the assistance extended could not be prolonged in instances where additional value from further aid would undoubtedly have been obtained. On an average the service engineer was able to remain from four to six months before new exigencies necessitated his detail to another State.

The engineering aid from the service to the State board of health of Kentucky was continued from the previous fiscal year. Associate Sanitary Engineer C. N. Harrub made investigations of several water supplies which had been suspected as being unsafe, and in detailed reports pointed out the deficiencies and desirable improvements. At Maysville, Ky., where a particularly high typhoid rate persisted, due to the unprotected water supply, the emergency relief measures feasible under the circumstances were determined and installed. Due to demands from other States the engineer had to be withdrawn from Kentucky in August, but in the early part of October the appeal for the assistance of an engineer to Kentucky was again complied with, as typhoid epidemics were reported in several towns of that State. During November and December part-time assistance of a service engineer was furnished to Kentucky. From January until the end of the fiscal year Asst. Sanitary Engineer A. E. Gorman was detailed full time to act as State sanitary engineer. Valuable work in the investigation of water and sewage systems, as well as several typhoid outbreaks, was accomplished by this engineer. Plans of new waterworks systems for a number of cities were reviewed and recommendations for proper action were made to the State health officer. At present arrangements have been provided by the State health board for the appointment of their own engineer, so that the continuance of the service engineer at this station will not be necessary for more than a short time.

The cooperative work in sanitary engineering control in Tennessee was commenced on July 9, 1919, by Associate Sanitary Engineer C. M. Baker, this State being without any sanitary engineering personnel. In September this engineer was replaced by Associate Sanitary Engineer C. N. Harrub. Because of service efforts in organizing the sanitary engineering work in this State, the State board of health has commenced to function in this field. During the year investigations were made by the service engineer of 55 water supplies, 34 sewerage systems, 5 typhoid outbreaks, and 2 institutions. Improvements were instituted at 12 of the waterworks, 5 of the sewerage systems in connection with one of the typhoid outbreaks, and at one of the State institutions. Communities in this State have readily availed themselves of the services of the engineer and have instituted the recommended improvements where necessary.

Direct assistance in the supervision of sanitary works of public import was extended to the State Board of Health of Arkansas.

Upon the completion of the survey of State control over public water supplies at the end of the fiscal year 1919, a sanitary engineering division with a qualified sanitary engineer as director was established by the board. Associate Sanitary Engineer S. Pincus was detailed to Arkansas in August, 1919, to assist the newly organized division in instituting the effective sanitary supervision desired. In a short time numerous towns reported improvements or new installations of water or sewage works pending. A plan for the routine field inspection and examination of all public water supplies in the State was inaugurated. Special efforts were made to educate the operators of the water-treatment plants in the scientific control of purification plants. A systematic procedure for the supervision and certification of water supplies used for domestic purposes by railroads was instituted. Up to March, 1920, when Engineer Pincus was withdrawn, 25 water-supply investigations in Arkansas had been carried out by the service engineer.

Following the establishment of a sanitary engineering division in the State Department of Health of Oklahoma during the previous year, the part-time assistance of a service engineer was furnished upon request. Associate Sanitary Engineer Pincus was detailed to Oklahoma in September, 1919. The sole engineer of the division was found to be overwhelmed with calls for work due to great activity in the construction of new sewage and waterworks systems. Numerous towns over the State were proposing and installing sanitary works to the extent of many millions of dollars. It is at such a period that expert State sanitary engineering service is of utmost importance to prevent undesirable features in these sanitary works. Service assistance included the investigation of 15 water supply and sewage problems, as well as three reported outbreaks of typhoid fever, and extended to the inauguration of a routine supervision of public water supplies, especially those in use by common carriers in interstate traffic. The cooperative work with the Oklahoma State sanitary engineering division had to be terminated early in February, 1920, because of insufficient personnel in the service.

Upon the request of the State health officer, Associate Sanitary Engineer S. Pincus was detailed December 4, 1919, to January 6, 1920, to make an investigation of the sanitary engineering facilities and supervision of the Georgia State Board of Health. A study was made of water supply, sewage, and allied problems, and the extent to which the needs in this field of public health work were being met by the State health authorities. Ineffective control over new installations or existing works constructed for the protection of the health of communities was found. Recommendations were made for the enactment of new State regulations by the board of health, and the organization of a division of sanitary engineering in the State board of health was advised. This division should consist of a chief engineer, assistant engineers, and laboratory personnel and should provide State supervision over new installations and improvements to waterworks and sewage systems, and the operation of these plants. This division should furnish advice to cities and towns in their sanitary problems. A consolidation of the existing division of water analysis with the proposed new sanitary engineering division was urged. An initial annual budget of \$15,000 was considered adequate for the proper commencement of this work. The State board of health

immediately authorized the creation of the sanitary engineering division. Two months after the service investigation Mr. H. C. Woodfall, engineer in the service, was appointed by the State health officer to take charge of the division of sanitary engineering.

A few days after the arrival of Engineer Pincus in Georgia, unprecedented floods occurred in the western section of the State. At the urgent request of the State health officer, the engineer proceeded to West Point, Ga., to provide sanitary measures following the flooding of large sections of this city of 20,000 population. An illustration of the great value of sanitary engineering service to the State was furnished in the prevention of even a single case of water-borne disease in this flooded region through the measures instituted for the emergency chlorination of all water supplies temporarily in use for the rapid replacement of sanitary safeguards to the public supply when reinstalled.

For a long time the service had been requested by the State health officer of Iowa to undertake an investigation of the public water supplies, the water supplies used by railroads and allied sanitary engineering problems in that State. Associate Sanitary Engineer H. H. Wagenhals was detailed August 15 to November 25, 1919, to render this assistance. A very complete survey was made of 62 water supplies used by common carriers in the State and detailed reports of these investigations, including recommendations for the improvement of certain supplies, were furnished the State.

The service assisted the State board of health of Nebraska in the maintenance of its sanitary-engineering activities which were in danger of curtailment due to lack of personnel and funds. Assistant Sanitary Engineer C. H. Spaulding was detailed to this State on August 5, 1919, and remained for the greater portion of the next eight months, until April, 1920. During this period he collected data on the conditions of the water supply in Nebraska in use by common carriers and also served as acting State sanitary engineer for several months in the absence of a regular State appointee. Many improvements in waterworks systems were obtained due to the activity of the service engineer.

Assistant Sanitary Engineer Spaulding, during this fiscal year, was also detailed to assist the State boards of health in North Dakota and South Dakota in connection with the certification of water supplies in use on interstate carriers for drinking and culinary purposes. Through this aid all the railway supplies in the State of North Dakota were inspected either by the State or service engineer. Only a few supplies were investigated in South Dakota as no provisions had been made by the State board of health for permanent supervision.

At the request of the State commissioner of health of Delaware a State-wide investigation of water supplies in interstate use was made April 19 to 29, 1920, by Associate Sanitary Engineer Sol Pincus and Asst. Sanitary Engineer J. I. Connolly, as well as a study of the State control over water supplies. A detailed survey was made of the Brandywine Creek watershed above Wilmington and the purification plants treating this water to determine the improvements required to obtain better results and especially for the elimination of objectionable tastes occurring at intervals in the purified water. The investigation disclosed certain methods for improving the water

supply. It also disclosed a condition of serious pollution of the raw water occurring within the State of Delaware. It was found that objectionable tastes were being produced by faulty and leaking sewers located directly over the intake. The other water supplies in Delaware used as sources of drinking water supply by railroads were inspected and found generally to be shallow-well supplies located near cases of soil pollution. Recommendations for the protection of these supplies were made to the individual communities through the State commissioner of health. A plan for an effective supervision of the water and sewage conditions throughout the State was submitted to the State health officer.

In order to assist the engineering division of the Wisconsin State Board of Health in the supervision of railway water supplies used for drinking purposes, Assistant Sanitary Engineer J. I. Connolly was detailed to Wisconsin for the months of May and June, 1920. Investigations were made and data collected enabling the certification of 36 of the water supplies used by railroads in that State, thereby expediting exceedingly the supervision of interstate used supplies.

Besides the assistance furnished the above-mentioned 11 States directly by a sanitary engineer from the Public Health Service, assistance was provided a number of States in the maintenance of their sanitary engineering activities by appointing one of the State board of health personnel as collaborating sanitary engineer in the Public Health Service. This arrangement proved fairly satisfactory at small cost to the Government for assisting such States in the certification of water supplies used in interstate traffic where adequate funds were not available. States so assisted during this fiscal year, were Maine, Vermont, Indiana, South Carolina, North Carolina, North Dakota, Idaho, and New Mexico.

FEDERAL HOME FOR LEPERS.

The Louisiana Legislature on July 6, 1920, passed an act providing for the transfer of the Louisiana State Leper Home at Carville, La., to the Federal Government for a consideration of \$35,000. The details of transfer will doubtless soon be completed and the service will assume control in the near future. The necessary alterations and expansion of the institution to meet Federal needs will be made from the \$250,000 fund available for the purpose and lepers will be transferred to the home within the coming fiscal year.

DIVISION OF FOREIGN AND INSULAR QUARANTINE AND IMMIGRATION.

Operations of the Public Health Service as to the administration of quarantine stations and enforcement of quarantine laws and regulations were conducted on the same general lines as formerly. During the year service officers inspected 15,500 vessels and 838,328 passengers and crew at the continental maritime stations. At border quarantine stations, 90,530 travelers were inspected exclusive of the local interurban traffic. There were detained 3,865 vessels, either because of disease on board or because the vessel came from an infected port, and 4,974 vessels were disinfected or fumigated.

At foreign and insular stations the Public Health Service officers inspected 7,639 vessels and 882,051 passengers and crew, and fumigated 1,384 vessels.

COMPLETION OF NATIONAL QUARANTINE SYSTEM.

During the year Congress made provision for the purchase of the New York Quarantine Station, the Baltimore Quarantine Station, and several quarantine stations formerly operated under the jurisdiction of the State of Texas. Appropriations were made for this purpose in the sundry civil bill of 1921 (available July 1, 1920), and, as soon as the respective jurisdictions furnish evidence of clear title to the property involved, the latter will be transferred to national control and operated by the Public Health Service. The Baltimore station and the Texas stations are already being operated by the Public Health Service under the terms of a lease, and the acquisition of title will not materially change conditions from those obtaining during the past fiscal year. With the passing of the New York Quarantine Station from State to Federal control, there will have been completed the national quarantine system, and all quarantine function at ports of entry and at international ports on the frontiers will be operated by the United States Public Health Service.

The act of Congress of February 15, 1893, which may properly be termed the organic quarantine act, by its general terms indicated that it was the policy of Congress to regard enforcements of quarantine laws and regulations as a function that properly devolved on the Federal authorities. The act contained authority for the Secretary of the Treasury to acquire those quarantine stations that were being operated either by State or local governments, and, as a matter of record, there is herewith set forth in tabular form the date and manner of acquisition of the various local and State quarantine stations by the National Government and the establishment of new stations as required.

The acquisition under Federal control of various State, local, and Territorial quarantine stations.

Station.	Date of acquisition.	Purchase price.	Act of Congress.
Eastport, Me.....	1912	No property involved.....	Sundry civil act, approved Aug. 24, 1912. ¹
Portland, Me.....	1903	\$52,000.....	Sundry civil act, approved Mar. 3, 1903, and sundry civil act, approved June 30, 1906. ²
Boston, Mass.....	1917	\$150,000.....	Sundry civil act, approved July 1, 1916.
Providence, R. I.....	1912	None: no property involved.	Sundry civil act, approved Aug. 24, 1912. ¹
Perth Amboy, N. J.....	1905	No property involved.....	Sundry civil act, approved Mar. 3, 1905. ¹
New York ³		\$1,395,275.....	Sundry civil act, approved June 5, 1920.
Delaware Breakwater, Del....	1892		Sundry civil act, approved Mar. 3, 1891.
Reedy Island, Del.....	1893	Transferred from Army.....	Sundry civil act, 1895. ¹
Delaware River (Marcus Hook, Pa.).....	1919	Leased.....	Sec. 8, act approved Feb. 15, 1893.
Alexandria, Va.....	1907	No property involved.....	Sundry civil act, approved Mar. 4, 1907. ¹
Baltimore, Md. ³		\$176,775.....	Sundry civil act, approved June 5, 1920.
Cape Charles, Va.....	1889	\$112,000 ⁴	Aug. 1, 1888.
Cape Fear, N. C.....	1894	\$25,000 ⁴	Sundry civil act, approved Aug. 18, 1894.
Newbern, N. C.....	1908	No property involved.....	Sundry civil act, approved Mar. 4, 1907. ¹
Washington, N. C.....	1908	Nominal: no property involved.	Do.
Georgetown, S. C.....	1908	.....do.....	Do.
Charleston, S. C.....	1908	.....do.....	Do.
Beaufort, S. C.....	1908	.....do.....	Do.
Port Royal, S. C.....	1908	.....do.....	Do.
Savannah, Ga.....	1900	\$20,000.....	Sundry civil act, approved June 6, 1900.
Darien, Ga.....	1916	No property involved.....	Sundry civil act, approved July 1, 1916. ¹
Brunswick, Ga.....	1903	\$20,000.....	Sundry civil act, approved June 6, 1900, also Mar. 3, 1903.
Fernandina, Fla.....	1903	\$5,000.....	Sundry civil act, approved June 28, 1902.
Mayport, Fla.....	1903	\$2,350.....	Do.
Miami, Fla.....	1903	\$23,600.....	Do.
Boca Grande, Fla.....	1903	\$3,500.....	Do.
Key West, Fla.....	1900	(⁵).....	Act approved June 6, 1900.
Tampa, Fla.....	1900	(⁶).....	Do.
Port Inglis, Fla.....	1903	No property involved.....	Sundry civil act, approved Mar. 4, 1909. ¹
Cedar Key, Fla.....	1903	.....do.....	Sundry civil act, approved June 28, 1902. ¹
Punta Rassa, Fla.....	1903	.....do.....	Sundry civil act, approved June 28, 1902. ¹
St. Georges Sound, Fla.....	1903	.....do.....	Do.
St. Joseph, Fla.....	1903	.....do.....	Sundry civil act, approved Aug. 24, 1912.
St. Andrews, Fla.....	1903	.....do.....	Do.
Pensacola, Fla.....	1903	\$30,000.....	Sundry civil act, approved June 28, 1902.
Mobile, Ala.....	1907	\$18,000.....	Special act, approved June 19, 1906.
New Orleans, La.....	1909	\$100,000.....	Do.
Pascagoula, Miss.....		No property involved.....	Sundry civil act, approved Mar. 4, 1909. ¹
Gulf Quarantine, Miss.....		\$45,000.....	Special act, approved Aug. 1, 1883; also Mar. 5, 1888.
Sabine, Tex. ³			
Orange, Tex. ³			
Beaumont, Tex. ³		\$90,071.....	Sundry civil act, approved June 5, 1920.
Port Arthur, Tex. ³			
Port Aransas, Tex. ³			
Galveston, Tex.....	1911	(⁴).....	Special act, approved June 19, 1906.

¹ First appropriated for maintenance.² Includes improvements to be made in addition to purchase price.³ Actual transfer of title not accomplished on Sept. 1, 1920, although in process.⁴ Original establishment.⁵ Original appropriation for establishment provided \$125,000 for Key West and Tampa (Mullet Key).

The acquisition under Federal control of various State, local, and Territorial quarantine stations—Continued.

Station.	Date of acquisition.	Purchase price.	Act of Congress.
Eagle Pass, Tex.....		No property involved.....	Sundry civil act, approved Aug. 24, 1912. ¹
El Paso, Tex.....		.....do.....	Do.
San Diego, Calif.....	1888	\$55,500.....	Special act, approved Aug. 1, 1888; sundry civil act, approved June 28, 1902. ²
San Pedro, Calif.....		No property involved.....	Sundry civil act, approved June 30, 1906. ¹
Santa Barbara, Calif.....		.....do.....	Do.
San Francisco, Calif.....	1888	\$103,000.....	Special act, approved Aug. 1, 1888. ³
Monterey, Calif.....		No property involved.....	Sundry civil act, approved Aug. 24, 1912. ¹
Port Harford, Calif.....		.....do.....	Sundry civil act, approved Mar. 4, 1907. ¹
Fort Bragg, Calif.....		.....do.....	Do. ¹
Eureka, Calif.....		.....do.....	Sundry civil act, approved June 30, 1906. ¹
Columbia River, Oreg., quarantine.	1899	\$30,000.....	Sundry civil act, approved July 1, 1898. ⁴
Florence, Oreg.....		No property involved.....	Sundry civil act, approved Mar. 4, 1907. ¹
Newport, Oreg.....		.....do.....	Do.
Coos Bay, Oreg.....		.....do.....	Do.
Gardner, Oreg.....		.....do.....	Do.
Port Townsend, Wash.....	1888	\$55,500.....	Special act, approved Aug. 1, 1888. ²
Honolulu, Hawaii.....	1900	\$60,000.....	Special act, approved Apr. 3, 1900; sundry civil act, approved June 28, 1902; sundry civil act, approved Mar. 3, 1903; sundry civil act, approved June 6, 1900.
Hilo, Hawaii.....			Do.
Kahului, Hawaii.....			Do.
Lahaina, Maui, Hawaii.....			Do.
Koloa, Hawaii.....			Do.
Mahukona, Hawaii.....			Do.
Makaweli, Hawaii.....			Do.
Kihel, Hawaii.....			Do.
San Juan, Porto Rico.....	1900	\$49,700.....	Special act, approved Apr. 12, 1900; sundry civil act, approved June 6, 1900; sundry civil act, approved Mar. 4, 1909; sundry civil act, approved June 4, 1910.
Ponce, Porto Rico.....			Do.
Aguadilla, Porto Rico.....			Do.
Arecibo, Porto Rico.....			Do.
Arroyo, Porto Rico.....			Do.
Central Aguirre, Porto Rico.....			Do.
Humacao, Porto Rico.....			Do.
Mayaguez, Porto Rico.....			Do.
Fajardo, Porto Rico.....			Do.
Guanaca, Porto Rico.....			Do.
St. Thomas, Virgin Islands.....	1917	No property involved.....	Executive order, Sept. 27, 1917.
Frederiksted, Virgin Islands.....			Do.
Christiansted, Virgin Islands.....			Do.
Philippine Islands, quarantine system.	1900	None involved.....	Executive order.

¹ First appropriated for maintenance.

² Includes improvements to be made in addition to purchase price.

⁴ Actual transfer of title not accomplished on Sept. 1, 1920, although in process.

³ Original establishment.

The United States quarantine regulations were revised, and several important changes were made therein that will result in greater efficiency and additional protection of the public health of the country, and, at the same time, probably will prove less obstructive to commerce than the former regulations. Material changes were made in the provisions relating to measures directed toward preventing the introduction of plague, cholera, yellow fever, and typhus. Greater stress was laid on bacteriological procedure in the regula-

tions relating to cholera, in preference to reliance on clinical symptoms or the employment of an arbitrary period as the stage of incubation. In the regulations on plague, the requirements are chiefly directed against the rat; the rôle of man in disseminating the disease is considered as of negligible importance. On account of the number of cases of anthrax occurring throughout the country, the infection for the most part being due to contaminated imported bristles that enter into shaving brushes, certain safeguards were provided to prevent the introduction of this kind of infected material from foreign countries—more especially from the Orient. Methods for the fumigation and disinfection of ships and the examination of passengers were standardized and various requirements, proven to be of small practical value, were eliminated from the regulations.

PROPOSED REVISION OF SANITARY TREATY.

The department took action, through proper channels, to effect the revision of the sanitary convention of Paris of 1912. At the time of the ratification of this convention by the United States the terms were deemed not entirely satisfactory and as containing provisions which would very inadequately protect the public health of the United States, and this Government, therefore, included in that convention a reservation which afforded some latitude in applying any special quarantine measures that might be necessary against infected ports. The sanitary convention of 1912 likewise signally failed to take into consideration modern advances in sanitary science, more particularly that relating to the rôle of cholera carriers and the transmission of bubonic plague almost exclusively by rodents; and typhus, which, in recent years, has proven to be even a greater scourge than cholera or plague, was wholly omitted from the treaty. Alterations contemplated in the event of the consideration of a new convention will include measures to prevent the spread of typhus fever, greater importance will be attached to the rôle of the rat in the spread of plague, and greater attention will be given to the healthy cholera carrier as a means of disseminating cholera infection. Recommendations will also be offered that the signatories to the treaty shall be empowered to enforce quarantine measures against any port or area which is reliably known to be infected, and this without awaiting the receipt of reports transmitted through diplomatic channels. This latter provision would be especially important, since experience has demonstrated that the signatories to the existing convention have not always complied with their responsibilities relative to the reporting of infected ports and areas, the omission apparently being due, in some cases, to the desire of local authorities to suppress the information and thus avoid quarantine restrictions commercially prejudicial, and in other instances to the fact that some of the governments have no one agency vested with the responsibility of transmitting sanitary information to other governments.

MEASURES INSTITUTED AT EUROPEAN PORTS.

With the cessation of hostilities in Europe and the resumption of maritime commerce, the danger of the introduction of epidemic diseases into the United States increased. During the war the public

mind of the various nations party to the conflict and all their energies and resources were directed along military channels, and sanitation and public hygiene, as a consequence, were more or less neglected. In the countries of Central Europe conditions became very favorable for the outbreak of epidemic diseases, and in many areas infection of typhus, plague, and cholera smoldered along ready to burst forth under conditions that subsequently were sure to arise. The saving feature of the whole situation was the restriction of travel from one country to another. The spread of epidemic diseases is proportionate to the volume of travel from one district to another, and, as overland and maritime commerce was reduced to a minimum during the war, the prevalence of epidemic diseases was more or less reduced to small local outbreaks. On the resumption of commercial intercourse the expected happened. Typhus spread throughout continental Europe by means of returning soldiers, repatriated prisoners, and, to a less extent, by commercial travelers. The ravages of typhus were more especially noted in Poland, eastern and southern Russia, and the Balkans, and the lack of the necessities of life incident to the drain of warfare, with inability to secure equipment or supplies to combat the disease, added very materially to the seriousness of the epidemic. Even before the armistice this condition of affairs was foreseen and medical officers of the Public Health Service were sent to Europe for the purpose of investigation and to make preparation for the application of preventive measures at European ports of departure whenever there should be resumed trans-Atlantic travel. At present officers of the Public Health Service are stationed at practically all of the important ports of continental Europe for the purpose of inspecting vessels and personnel prior to their departure for ports of the United States. All verminous persons coming from typhus-infected areas are required to undergo appropriate treatment, and detention when necessary, before embarkation. Notwithstanding this precaution, however, typhus has broken out on several of the vessels bound for ports of the United States, but, with the detection of the disease on the arrival of the vessel and the appropriate treatment of personnel at quarantine stations, the efforts to prevent the introduction of typhus from Europe has proven entirely successful. Measures in force along the Texas-Mexican border to prevent the introduction of typhus from Mexico into the United States have been equally effective. While typhus would probably never cause such a serious epidemic in the United States as in other countries, it is by no means improbable that the conditions in the tenement sections of the larger cities would not be productive of a serious epidemic of typhus if the infection were introduced into such localities.

GENERAL PREVALENCE OF QUARANTINABLE DISEASES.

Bubonic plague has been on the increase throughout the world, more so during the past year than at any time in the past decade, and, on account of cases of plague, either rodent or human, being reported in Spain, Italy, and Greece, all vessels from the Mediterranean are treated with suspicion upon their arrival at ports of the United States, and are required to be treated throughout for the destruction of rats. While India continues to be the main reservoir of plague

infection for the rest of the world, the disease was also reported as prevalent throughout the Orient and in Argentina, Brazil, Chile, Ecuador (Guayaquil especially), and Peru. More recently, an outbreak of considerable proportion occurred in Vera Cruz, Mexico. Passed Asst. Surg. Michel, who was attached to the American consulate at Vera Cruz, had had previous experience in antiplague work in New Orleans, and he was, therefore, tendered an appointment as technical advisor to the local authorities. He outlined a plan for plague suppression in Vera Cruz, which was adopted and adhered to with most satisfactory results. Later on, Dr. Michel, at the request of the supreme board of health, proceeded to Mexico City and devised a plan for the control of yellow fever in Vera Cruz. The spirit of the Mexican authorities in seeking and applying the most modern preventive measures against plague and yellow fever has been gratifying. Tampico was likewise infected, but not so severely as Vera Cruz. Vessels from Vera Cruz and Tampico were required to be fumigated for the destruction of rats prior to departure, under the supervision of service representatives at those places.

Of all the epidemic diseases, the spread of plague is the most difficult to prevent, since it is primarily a disease of rats and may remain undetected in a port, confined to the rodent population, with only occasional human plague, its presence even unknown to the authorities or deliberately suppressed to prevent commercial prejudice against the port. It is no difficult matter for rodents, hidden away in articles of freight, to be transported from an infected warehouse at some port not known to be infected, and carried to outside points, and the infection thus implanted in some other city or country not previously infected, which, in turn, might well become the distributing center of infection while the disease is spreading amongst the rats and before it appears in the human population. The only measure that seems to promise the successful exclusion of plague from seaports is the systematic fumigation of vessels for the destruction of rats and the maintenance of ships in as nearly as possible a rat-free condition. During the past year 4,974 vessels were fumigated for this purpose, some of them by sulphur dioxide and others by cyanide gas.

Cholera was reported chiefly from the oriental countries and from the interior of Europe, and thus far has not seriously threatened the ports of the United States. Should the disease extend to the Atlantic seaports of Europe, however, it then will be necessary to enforce precautionary measures similar to those that were so successfully utilized in preventing the introduction of cholera in 1911. In view of the assignment of medical officers of the Public Health Service to the American consulates at European ports, such measures would not be difficult in application.

Yellow fever was reported in epidemic proportion in Guatemala during May and June, 1920, and later spread to the Atlantic seaboard of that country. Sporadic cases, however, had been reported in the previous year on the eastern coast of Central America. Infection was also reported in a number of cities in Peru and a few localities in Brazil. It continued endemic in Yucatan (Merida), appeared in Progreso, and was reported in epidemic proportion in Vera Cruz during June, 1920. During the active quarantine season (from

Apr. 1 to Nov. 1) vessels from the Yucatan peninsula have been treated as from a known infected port, and the wisdom of this has on several occasions been evidenced by the apprehension and exclusion of cases of yellow fever on vessels from that region. A case of yellow fever occurred in the person of a returning American on a vessel bound from Progreso to New Orleans in December, 1919, and shortly thereafter another case was detected on a vessel from the eastern coast of Guatemala and held at the New Orleans Quarantine Station. Notwithstanding the various epidemics of yellow fever in Mexico, Central and South America, and the occurrence of the disease on various occasions on ships entering ports of the United States, the infection has been successfully excluded from this country for the past 14 years. If the quarantine service had accomplished no more than this, it would many times have repaid the cost of its maintenance.

The International Health Board has mapped out an elaborate campaign for the eradication of yellow fever from the world and appears to regard the project with some degree of optimism. There are several factors, however, that may well prove obstructive to that commendable program. With the lack of any easily applicable precise method of diagnosis of yellow fever, it is entirely obvious that mild cases of the disease may fail to be detected. In various parts of Mexico, Central America, and South America many towns and cities are sadly lacking in any organization or equipment for the detection, the reporting, or the combating of yellow fever and malaria, and, to add to these handicaps, it is the tendency of some local authorities to suppress reports of the disease or to delay the announcement because of the commercial injury that may result from the imposition of quarantine by outside localities or governments.

Smallpox of a virulent type continued to prevail in Mexico, and because of the opposition of the mass of the population to vaccination, it is not expected that the smallpox situation in that country will materially improve in the near future. To prevent the introduction of smallpox from Mexico into the United States, incoming travelers were vaccinated unless presenting evidence of immunity by recent vaccination or an attack of the disease. During the year 56,463 persons were vaccinated at different points on the Mexican frontier. During the winter of 1919-20 smallpox threatened from the north, as an epidemic of considerable proportion occurred in the province of Ontario, more especially in the city of Toronto, where several thousand cases were reported. While there were only 28 deaths, the type of the disease varied from the mild to the severe. Absolute protection to the United States would have necessitated the total prohibition of all border travel. This was not only impracticable, but it was also deemed to be unjustifiable, and, to meet the situation and to afford a relatively effective safeguard against the introduction of the disease, routine vaccination of all incoming travelers was instituted at border points. At Buffalo, Niagara Falls, Detroit, Port Huron, Sault Ste. Marie, Ogdensburg, and several towns of smaller population, medical officers and employees of the Public Health Service, during the period from December to March, inclusive, vaccinated 52,921 persons. In addition to this number, many thousand more were vaccinated by Canadian authorities and

private physicians. As the number of cases in Ontario had very materially subsided and the epidemic practically abated by March, vaccination requirements were then discontinued. The enforcement of vaccination, however, seemed to have very successfully served its purpose, as no smallpox was reported in the northern United States other than the mild and occasional sporadic cases that occur each winter.

QUARANTINE OPERATIONS ALONG THE MEXICAN BORDER.

Service operations at El Paso, Laredo, Eagle Pass, Brownsville, Rio Grande City, and Hidalgo were carried out in the same manner as in the previous year and were directed chiefly against the introduction of typhus and smallpox, although all incoming travelers were subject to inspection, and due precautions were exercised against the introduction of other quarantinable diseases. Fortunately yellow fever was confined to the southern and southeastern part of Mexico, and, with the disorganization of railroad traffic in Mexico, the danger of the introduction of yellow fever by overland travel at no time appeared very serious. The one aspect of the Mexican border quarantine that is of serious concern is the opportunity that presents for illegal entry at unguarded points at any time that quarantine, immigration, or customs restrictions are materially obstructive to travel at the ports of entry. There is an increased tendency toward clandestine crossing, as it is only necessary for travelers to proceed a short distance above or below the port of entry in order to gain admittance to the United States without hindrance. Until some arrangement shall have been effected for border patrol, extending from Brownsville on the Gulf to Tia Juana on the west, any prohibition against travelers from Mexico, whether it be of quarantine, immigration, or customs nature, will fall far short of the objective aimed at. The antityphus measures instituted appear to be successful. There has been no case of the disease reported within the United States as coming from Mexico.

Statistical data of quarantine transactions on the Texas-Mexican border for the fiscal year ending June 30, 1920.

Title.	Brownsville.	El Paso.	Eagle Pass.	Hidalgo.	La Jitis.	Laredo.	Presidio.	Rio Grande City.	Total.
Inspected from interior Mexico.....	4,327	39,188	8,409	1,941	-----	35,711	373	581	90,530
Local passengers inspected...	287,871	1,900,169	564,901	8,729	983	476,081	4,679	5,052	3,248,465
Total persons disinfected.....	594	92,849	22,001	132	1	14,828	-----	91	130,496
Total persons passed without treatment.....	289,367	1,807,320	551,309	9,619	308	462,121	4,679	6,904	3,131,627
Total persons vaccinated....	2,738	21,183	2,249	336	670	22,175	5,090	577	55,018
Total sick detained for observation.....	-----	-----	-----	-----	1	1	-----	5	7
Totalsick refused admission	93	91	-----	91	4	448	4	7	638
Total pieces baggage disinfected.....	7,806	14,065	27,291	124	-----	10,536	151	140	60,113

IMPROVEMENT OF FLOATING EQUIPMENT.

On account of the deterioration of the floating property at the various quarantine stations, it was necessary to make material expenditure in the repair, preservation, and, in a number of instances,

replacement of launches and tugs. For the Port Townsend station there was secured a single-screw launch, 65 feet long, and equipped with a Frisco Standard engine. This vessel was obtained from the Navy after a service of less than two years, and, by minor repairs to the hull and to the engine, it is practically a new vessel and should give satisfactory service for a long period.

Two 60-foot motor launches, to be equipped with 65-horsepower Frisco Standard engines, were in the course of construction at the end of the fiscal year, one being provided by an appropriation of Congress for a launch at New Orleans and the other by an appropriation for a launch at Astoria quarantine. On account of changing conditions, however, it is probable that, when completed, these launches can be utilized more advantageously at some other station.

Two steam tugs were completed by the United States Maritime Corporation at a cost of \$55,000 each. One will be assigned to Boston quarantine and the other to the Cape Charles station.

The launch *Nymphæa IV* was transferred from Boston to San Juan, and for the Boston station there was secured from the Navy a motor launch, 66 feet long, equipped with a Van Blerc motor. This launch was comparatively new, and with a few repairs to the hull and motor makes a very satisfactory boarding vessel. It was renamed the *Hugh Ward*. The Fernandina station was provided with a new gasoline launch, 24 feet in length, named the *Porter*. Two launches, practically new, were secured from the Navy and assigned to the Cape Charles quarantine station—one, the *Widgeon*, a launch of 64-foot length, equipped with a Palmer heavy-duty engine, and the other a 35-foot motor boat (unnamed), equipped with a medium-duty Van Blerc engine. At the end of the year new launches were under construction for the Aransas Pass quarantine station and the Tampa Bay quarantine station. New engines were provided for the launch *Plover*, on duty at Cape Charles; the launch *Cape Fear*, at Southport; the small launch at Reedy Island; the launch *Spray*, at Charleston; the *Genevieve*, at Pensacola; the *Sea Gull*, Boca Grande; and the *Albatross*, San Francisco. The engines purchased were of the heavy-duty type, and promise to give satisfactory service for long years to come.

RECOMMENDATIONS AND PROSPECTIVE PLANS.

During the year the service secured title to 12 acres of land located on an artificial island in Mobile Bay near the mouth of the river. It is contemplated, if Congress will provide sufficient funds, to establish a modern quarantine station at this site and abandon the present station at the entrance to the harbor, transferring for the use of the Army post near-by such buildings and wharves as can be utilized. The present station is built exclusively on piling, the buildings being connected by a series of gangways. It is a type of construction that is exceedingly expensive of maintenance, causing frequent renewal of piling, and, because of storm damage (some years light and some years quite severe), the upkeep of the station is disproportionately high. It would undoubtedly prove more economical in the end to construct a new station on Sand Island, where the cost of administration will be less and where a more substantial

construction will materially lower the cost of repair and preservation. The present station practically serves no purpose other than as quarters for the medical officer and station force, though a small space is available for the detention of a few persons. A port the size of Mobile should have a quarantine station sufficiently equipped for the isolation of at least 100 persons and with equipment for the treatment of any infected vessel entering the port and the infected or suspected personnel.

Quarantine facilities for the port of Providence are wholly inadequate, and on several occasions it has been necessary to remand infected vessels to New York. It is purposed to request of Congress that appropriation be made for the construction of a quarantine station in Narragansett Bay, to be utilized in case of necessity not only in connection with the shipping entering Providence but also commerce that goes to Fall River and other ports in the neighborhood of Narragansett Bay. It is estimated that adequate quarantine facilities for this purpose, including land, building wharves, etc., will amount to approximately \$600,000.

VIOLATION OF QUARANTINE LAWS.

During the fiscal year the department passed on 477 cases involving violation of the act of February 15, 1893, pertaining to the failure of masters to present American consular bills of health. Of the total, 415 were dismissed without penalty because of extenuating conditions due, in some instances, to the lack of an American consular representative at the foreign port of departure, and, in other cases, due to the diversion of the vessel from the original port of destination by orders received on the high sea after the vessel had left port. The total amount of fines collected was \$3,100.

In the latter part of the fiscal year the Italian authorities took exception to the performance of official duties by officers of the Public Health Service attached to American consulates in Italy on the grounds that the performance of these duties was contrary to certain internal laws of Italy. The Italian port authorities prohibited the inspection of passengers or crews on Italian vessels by service representatives, as likewise service supervision of any and all precautionary measures called for by the United States quarantine regulations. Under this condition of affairs, bills of health were refused all vessels affected by the prohibition of the Italian authorities as to service supervision, and appropriate treatment was enforced against such vessels and their personnel upon arrival at ports of the United States. This necessarily caused inconvenience and additional expense to both steamship companies and the traveling public, and it is to be hoped that the Italian authorities will reconsider their attitude, especially in view of the fact that the service activities to which exception is taken are simply those that have been carried out in Italy and other foreign ports during the past 20 years, to the great convenience of the shipping interests and the traveling public, and which have operated as an additional safeguard to ports of the United States.

Transactions at national quarantine stations for the fiscal year ended June 30, 1920.

Stations.	Vessels inspected.	Vessels fumigated.	Passengers and crews inspected.
Alexandria.....			
Atchafalaya (Morgan City).....			
Baltimore.....	937	221	37,805
Beaufort.....			
Biscayne Bay.....	555	43	9,107
Boca Grande.....	30	3	1,108
Boston.....	679	85	83,568
Brownsville ¹			4,327
Brunswick.....	26	8	768
Cape Charles.....	2,604	660	121,132
Cape Fear.....	63	7	2,402
Cedar Key.....			
Charleston.....	275	68	9,444
Columbia River.....	22		664
Coos Bay.....	3		75
Cumberland Sound.....	94	3	3,132
Darien.....	2		28
Delaware Breakwater.....	34		788
Eagle Pass ¹			8,409
Eastport.....	345		30,314
El Paso ¹			39,188
Eureka.....	4		57
Fort Bragg.....			
Freeport.....	89	3	1,901
Galveston.....	678	70	20,486
Georgetown.....			
Gloucester.....	44		443
Gulf.....	74	21	1,379
Hidalgo ¹			1,941
Hoquiam.....	14		181
Ketchikan.....	115		6,646
Key West.....	1,227	10	143,557
La Jitis ¹			
Laredo ¹			35,711
Marcus Hook.....	1,255	131	52,661
Minera ¹			
Mobile.....	462	166	10,950
Monterey.....			
New Orleans.....	1,737	173	80,316
New Orleans City.....		1,084	
Newport.....	5		155
Pascagoula.....	37	14	351
Pensacola.....	210	44	3,587
Perth Amboy.....	34	7	1,068
Port Angeles.....	16		200
Port Aransas.....	7	3	83
Portland.....	152	5	11,653
Port Royal.....			
Port San Luis.....	37		1,465
Port Townsend.....	241	145	22,784
Presidio ¹			373
Providence.....	83	2	15,551
Reedy Island.....	11	1	396
Rio Grande City ¹			581
Sabine.....	556	33	17,931
St. Andrews.....	44	2	378
St. Georges Sound.....	1		10
St. Johns River.....	159	18	3,912
St. Joseph.....	8	1	66
San Diego.....	864		8,815
San Francisco.....	745	609	105,886
San Pedro.....	368	23	12,359
Santa Barbara.....	1		16
Santa Helena ¹			
Savannah.....	231	37	7,092
South Bend.....			
Tampa Bay.....	390	63	6,982
Vineyard Haven.....	6		50
Washington, N. C.....			
Zapata ¹			921
Total.....	15,574	3,764	931,158

¹ Border station. Statistics do not include "local" travelers, who, however, were subjected to cursory inspection. Through travelers were given close examination.

Report of annual transactions at foreign, insular, and domestic stations for the year ending June 30, 1920.

[Total ¹ inspections: Vessels, 22,940; crew, 985,276; passengers, 676,700. Total personnel inspected, 1,661,976. Vessels passed on certificate of ship's medical officer, 245.]

Nature of infection.	Vessels detained for observation or treatment (detention for purposes of inspection only not to be included).						
	Yellow fever.	Rodent plague.	Human plague.	Small-pox.	Typhus.	Cholera.	Leprosy.
Vessels from infected ports ²	175	3,688	6	16	1	.....	.....
Infected vessels ³	1	.....	1	12	1	.....	.....
Number of cases.....	1	.....	1	14	1	432	1
Number of crew detained.....	1,188	.....	68	262	499	246	142
Number of passengers detained.....	378	.....	153	.....	3,629	90	135
Personnel disinfected.....	.....	.....	.....	125	2,409	152	.....
Personnel examined bacteriologically or vaccinated ⁴	39	.....	.....	3,920	.....	361	.....
Vessels fumigated: ⁵							
HCN.....	7	1,793	.....	.....	.....	.....	.....
SO ₂ ⁶	164	2,975	.....	11	2	3	.....
HCN and SO ₂.....	.....	40	.....	.....	.....	.....	.....

Number of rats destroyed on ships, 26,140. Rats examined, 2,833.

¹ An inclusive figure, regardless of treatment or report elsewhere.

² Refers to vessels held for observation when from an infected or suspected port, with no cases en route or on arrival.

³ Vessels with cases on board at arrival or reported en route.

⁴ Includes carriers.

⁵ To also include microscopical examinations of blood, excreta, tissue, etc.

⁶ To include vessels fumigated after passing quarantine in accordance with provisional pratique.

REPORTS FROM NATIONAL QUARANTINE STATIONS.

Baltimore quarantine station.—Acting Asst. Surg. T. L. Richardson in charge. Post-office, express, and telegraph address, Fort McHenry, Baltimore, Md.

This station continued to be operated during the year by the service under the terms of a lease. Congress, in the sundry civil bill, 1921, provided an appropriation for the purchase of the station, and it is contemplated that this will be done and property passed to the ownership of the United States Government as soon as necessary formalities can be completed. The property is located at Leading Point on the west side of the Patapsco River, 7 miles distant from Baltimore by water and 9 miles by overland route. The station is at present maintained under the supervision of a caretaker, available for use, however, whenever it becomes necessary to detain passengers or crew, or for the reception of those sick with quarantinable diseases or whose isolation is necessary by reason of exposure to such quarantinable diseases.

The inspection of vessels, however, is carried out at Fort McHenry, a point much nearer to Baltimore city and more convenient for service operations. At Fort McHenry there are maintained office quarters for the quarantine officers and also facilities for the boarding vessel and space for the storage of fumigating materials. Nine hundred and thirty-seven vessels were inspected during the year, with a total of 36,939 members of crew and 866 passengers. Two hundred and twenty-one vessels were fumigated for the purpose of destroying rats and vermin.

Thirty-one cases of smallpox and one case of typhus fever were received and treated at the detention station. All of these patients were covered.

During the year, quarantine tug *Neptune* was transferred from Reedy Island to Baltimore.

Biscayne Bay quarantine station.—Post-office and telegraphic address, Miami, Fla. Acting Asst. Surg. James M. Jackson in charge.

There has been a very considerable increase in shipping at this port during the past year, more especially in the fruit trade with the Bahama Islands and with Cuba and in the oil trade with Tampico, Mexico, and the prospects are that this commerce will continue to increase in amount. Arrangements have been made to double the wharfage of the municipal docks and to increase the channel depth from 18 to 25 feet of water.

During the year, 555 vessels were inspected and 43 vessels were fumigated for the destruction of rats. These ships had a total of 3,099 crew and 6,008 passengers.

Boca Grande (Fla.) quarantine.—Post-office address, South Boca Grande, Fla.; telegraphic address, Boca Grande, Fla. P. L. McAdow in charge.

This station is in charge of the custodian, P. L. McAdow, who attends to the general administration of quarantine affairs other than the inspection of incoming vessels or supervision of fumigation. The professional duties are discharged by Acting Asst. Surg. Mart Hammond, who is notified by the custodian whenever his services are required.

Acting Asst. Surg. Mart Hammond replaced Acting Asst. Surg. W. M. Mathews. No other change has been made in the staff.

Extensive repairs to the boat basin and gangways are under way and are being rapidly pushed to completion.

A new engine has been ordered for the boarding launch *Sea Gull*, the present one being almost unserviceable, rendering the launch dangerous in landing at docks and alongside vessels. Repairs will shortly be made to her hull and cabin.

During the year, there were inspected 30 vessels, 3 of which were fumigated for the destruction of rats, with a total personnel of 1,108, of whom 1,102 were crew and 6 were passengers. No quarantinable diseases were noted throughout the year.

Boston quarantine station.—Post office and telegraphic address, Gallops Island, Boston, Mass. Surg. William M. Bryan in charge.

The only change of officers at this station during the past year has been the transfer of Pharmacist Van Ness. The number of attendants remains unchanged.

No new structures have been erected, but minor repairs have been made to roofs, doors, and windows. Practically every building on the station requires painting, and all of the older buildings require more or less extensive repairs.

The launch *Nymphæa* was transferred to Porto Rico in October, 1919, and in May, 1920, a new and larger launch, the *Hugh Ward*, was put in commission.

A new soap-spraying apparatus has been installed in the new bath-house, and has proved most satisfactory.

During the past 12 months two noteworthy events have occurred—the return of the American Expeditionary Forces, and the detention of vessels from Italian ports. The former increased the number of passengers passing through the port and the latter tremendously increased the amount of professional work.

Transactions: During the fiscal year ending June 30, 1920, a total of 679 vessels entered quarantine, as follows:

Steamers.....	646
Motor ships.....	4
Schooners.....	26
Barks.....	2
Ships.....	1

Of this number 85 were fumigated and treated as follows:

Fumigated with sulphur.....	59
Fumigated with hydrocyanic-acid gas.....	17
Fumigated with hydrocyanic-acid gas and sulphur.....	9

The above vessels carried crews numbering 38,547, and 45,021 passengers, making the total personnel inspected 83,568.

The following cases were treated in hospital:

Inguinal adenitis.....	1
Syphilis.....	2
Measles.....	1
Chickenpox.....	3
Pneumonia.....	1
Gastro enteritis.....	1

Brownsville, Tex.—Acting Asst. Surg. G. D. Fairbanks, in charge. Quarantine regulations have been carried out during the past year as usual and no cases of either typhus fever or smallpox have been known to develop in this section. While smallpox used to be an endemic disease along this part of the coast, vaccination measures seem to have conquered it. It seems quite probable that typhus will never develop because the body louse is practically unknown and persons coming to this climate are soon rid of them. The head louse is plentiful, but, nevertheless, typhus is absent.

Five physical examinations of surfmen for the United States Coast Guard have been made, nine patients treated for the same service, and one antityphoid administration to an immigration inspector. The quarters of the Coast Guard station have been inspected as to sanitation and general condition of the men.

The deep-water port mentioned in last year's report has not yet materialized, but active steps are being taken to rush the enterprise and work on it is looked for within a month or two.

Cape Charles quarantine.—Post office and telegraphic address, Fortress Monroe, Va. Passed Asst. Surg. H. F. Smith in charge.

During the past fiscal year there has been a marked increase in the number of ships passing through this station, 2,604 vessels having stopped for quarantine treatment, as compared with 1,641 during the preceding year, an increase of 59 per cent in the number of vessels.

The personnel of the ships' crews inspected numbered 107,321. In addition to these there were 13,811 passengers inspected, making a total of 121,132 persons inspected at the station.

No cases of any quarantinable disease were found on any of the ships inspected.

Six hundred and sixty vessels were fumigated for the destruction of rats, as compared with 157 for the preceding year, an increase of 320 per cent. Six hundred and fifty-four of these ships were fumigated with sulphur and six with cyanide. Twenty-four vessels were fumigated at the request of the ships' agents. Fifteen thousand seven hundred and twenty-six rats and 200 mice were found dead after fumigations, as compared with 2,227 rats for the previous year, an increase of 484 per cent in the number of rodents exterminated.

Two vessels were fumigated at the request of the Coast and Geodetic Survey and four vessels at the request of the United States Army.

The inspection of arriving alien seamen at this station was discontinued at the beginning of the present fiscal year, these activities being transferred, respectively, to Norfolk and Newport News.

Transportation to and from the various vessels was furnished to the United States Customs Service for the entire year.

A few repairs and alterations have been made to the hulk *Chase*. These include the construction of a sulphur bin, the capacity of which is about 30 tons. The marked increase in fumigation activities, which required the use of from three-fourths to 1 ton of sulphur daily, made the need for such a storage capacity an absolute necessity. A transverse partition has been constructed across the main deck of the *Chase* and the forward section converted into a dining room for attendants.

The addition of the gasoline launch *Widgeon* to the station equipment has greatly helped the operations of boarding and fumigation. The launch *Plover* has been out of service during the entire year. The installation of the new motor in this launch will materially increase the efficiency of the fumigation activities, which during the major part of the year have had to be conducted by means of a small yawl.

The construction of the new buildings on Craney Island was practically completed in October, 1920. The buildings erected included quarters for officers, attendants, and nurses, an administration building, three buildings for detained cabin passengers, five large barracks buildings for steerage passengers, a modern-plan hospital with wards and isolation rooms, kitchen and three large mess halls, delousing and sterilizing building, power house and laundry. An excellent water supply is furnished the Craney Island station from an artesian well 592 feet deep. The well is of the flowing type. A 100,000-gallon storage tank has been constructed for storage and fire-prevention purposes. The power house is equipped with two boilers, one of 100-horsepower and the other of 125-horsepower capacity. The engine room contains both steam and electric pumps for filling the storage tank, and also one modern centrifugal fire pump driven by gasoline motor. A completely equipped laundry has been installed. With the exception of the medical officers' quarters and the quarters for attendants, the entire station is heated from a central heating unit. The two buildings mentioned are heated by means of individual heating units. All steerage barracks when completed will be equipped with Gosso bunks. The capacity of these buildings will be about 1,356. Equipment for about one-third this number has been installed up to the present. The construction of the necessary retain-

ing bulkhead and the subsequent filling-in operations under the supervision of the United States Army Engineers at Craney Island is still under way, and a great amount of new land has already been made. Leakage from these operations, however, has rendered the channel into the dock at Craney Island unnavigable except at high tide. The proposed new bulkhead and channel on the south side of the island, which is to be completed within the next five or six months, will, however, remedy this condition. The completion of the Craney Island station will give to the Hampton Roads district a thoroughly modern and well-equipped quarantine station.

Eagle Pass, Tex.—Acting Asst. Surg. Lea Hume reports as follows:

The passenger traffic for the year shows a slight increase over last year, although there is no established railroad connection with Mexico.

The disinfection of clothing and destruction of lice has been continued efficiently throughout the year.

Practically all Mexicans living in Piedras Negras, Mexico (across the Rio Grande), have been vaccinated at the plant or are protected against smallpox by immunity.

Except for exigencies arising at the plant due to bad water (scaling) in the boilers, there has been practically no difficulty.

No contagious disease has gained access through this port during the year.

Eastport, Me., quarantine.—Acting Asst. Surg. John E. Brooks in charge. During the year 345 vessels were inspected and passed. These vessels carried 30,314 passengers and crew. In addition to the above vessels many small motor craft arrive daily. These small craft carry from 1 to 25 passengers. Most of these people come to shop, but many come seeking employment in the canning factories and also to take trains or steamers for points farther west.

It is from this motor transport service that Eastport and eastern Maine receive most of the undersirable immigrants. The Wilcox family, deported last month and the Daley family, about to be deported, arrived in this manner. In each instance they remained long enough for a feeble-minded daughter to marry another like herself. It is impossible to keep in touch with all these small boats, as they land anywhere along the coast and at all times of the day or night. It is only by accident that we find them. The above-named families were found by an officer from this station and turned over to the immigration officer.

Two hundred and ten persons were vaccinated at this station during the year. About 50 of these were school children, each of whom was given a certificate. As the city does not employ a school physician, the question of vaccination of the children was taken up with the superintendent of schools and all the children were given free vaccination. As a result 95 per cent of the children are vaccinated. The other 5 per cent escape, as the records kept by the teachers are not complete.

Scarlatina has been prevalent in this city during the past year. The disease has been of a mild type, only one death occurred. Many of the cases were so mild that a physician has not been called, and as a result the disease has been allowed to spread. In the same way the disease was kept under cover among the people living on the near-by

Canadian Islands and it is from this source that this city became infected. Health officers have been appointed by the provincial authorities to have charge of the near-by districts. In the future there will be active cooperation between these officers and this station. Forty ex-soldiers were examined at this station during the year for the War Risk Insurance Bureau and 16 reexaminations were made. As many more have been given application forms but have not as yet returned for examination.

It is surprising to find that many of the ex-soldiers do not know anything of their privileges under the war-risk insurance law. One young man was picked up on the street by his commanding officer almost totally disabled and almost a pauper.

This office has been open for examinations of ex-service men at any and all hours, Sundays and holidays included.

El Paso, Tex.—Asst. Surg. J. W. Tappan, in charge, reports that no important changes have been made in the usual routine at the quarantine station during the fiscal year.

A more thorough system of vaccination has been instituted by assigning three attendants exclusively to this work during the hours from 6.30 a. m. to 10.30 p. m., two being on duty during the busiest hours. All of the male attendants (nine) have been instructed in methods of vaccination and one is on duty at all hours to vaccinate persons crossing the border.

On account of the presence of bubonic plague in Mexico, all freight cars coming from infected points are fumigated with hydrocyanic acid gas, and precautions have been taken with regard to the possibility of the appearance of any infected persons. Strict scrutiny of passengers is made, but it has not been necessary as yet to detain anyone on account of suspected bubonic plague.

Passengers from Juarez, Mexico, as well as those from the interior of Mexico, who are obviously clean and are not louse infested are permitted to pass after inspection and vaccination without going through the disinfecting plant. The working class in Juarez, known as "locals," pass through the plant once a week, a bath certificate being issued to them and taken up at the expiration of the week, a new one being issued after each disinfection. The system of night passes instituted three years ago still obtains, and persons entering the port from Mexico after 9 p. m. are required to have a permit signed by the medical officer in charge.

The total number of inspections of local passengers this year was 1,900,169, and of these 1,807,320 were passed without treatment in the disinfecting plant, so that it will be noticed that but 52,661 local passengers, residents of Juarez or its neighborhood, out of the total 1,900,169 were required to pass through the plant at various times.

Summary of the quarantine transactions during the year is as follows:

Persons from interior of Mexico inspected.....	39, 188
"Local" passengers inspected.....	1, 900, 169
Persons disinfected (deloused) at plant.....	92, 849
Persons vaccinated.....	21, 183
Sick detained for observation.....	0
Sick refused admission.....	91
Pieces of baggage disinfected.....	14, 065
Cases of typhus in El Paso since July 1, 1919.....	3
Persons passed without treatment.....	1, 807, 320

Freeport (Tex.) quarantine station.—Acting Asst. Surg. J. R. Hawkins reports as follows:

On August 31, 1919, the control of quarantine operations at this port by the Texas State Board of Health was discontinued and jurisdiction was transferred to the Public Health Service under the terms of a lease, which provided for the ultimate purchase of the Texas State quarantine property by the United States Government. Dr. J. R. Hawkins, who previously served as State quarantine officer, was continued on duty and appointed acting assistant surgeon in the Public Health Service.

The commerce at Freeport is almost exclusively confined to vessels trading with Tampico, Mexico, and engaged in the transportation of oil. An occasional vessel arrives at Freeport for a cargo of sulphur. On account of the appearance of plague at Tampico special precautions have been taken against vessels arriving from that port, including fumigation when necessary, rat guarding and fending off of vessels lying alongside wharves. No quarantinable diseases have been observed at this station during the fiscal year. From September 1 there have been inspected 89 vessels. In addition to quarantine function the medical officer also makes medical examination of arriving aliens, chiefly alien seamen, for immigration purposes. Physical examination was also made for the Coast Guard Service and medical relief extended to employees of Government dredges operating north of Brazos River.

Gulf quarantine.—Post office and telegraphic address, Gulfport, Miss. Acting Asst. Surg. C. A. Sheeley in charge. As in previous years, quarantine inspection was conducted in the channel off Gulfport and the detention station at Ship Island was maintained under the charge of a caretaker. No quarantinable diseases were encountered during the year.

Hidalgo (Tex.) quarantine.—Acting Asst. Surg. W. P. Woodall in charge. The Public Health Service maintained a small quarantine station at this port, with sufficient equipment for the disinfection of clothing and personal effects and persons of incoming travelers, when necessary. Travelers arriving from the higher areas of Mexico are systematically examined for vermin and those that are vermin infested (lice) are divested of their clothing, given naphtha baths, and their clothing also disinfested. Special care is also observed to prevent the introduction of smallpox from Mexico, and, during the year, all nonimmunes and possible contacts have been vaccinated. Three hundred thirty-six vaccinations were performed. One hundred thirty-two persons were disinfested and their baggage given appropriate treatment. No quarantinable diseases were observed in the vicinity of Hidalgo north of the Rio Grande River that could be traced to Mexico through the port of Hidalgo.

Laredo, Tex.—Acting Asst. Surg. Nat K. King in charge. It was not necessary during the past year to impose any special quarantine regulations at this port other than the usual routine.

Inspection and method of treatment as described in the annual report of 1919 have not been changed.

Up to September 1, 1919, the quarantine work at this station was conducted in cooperation with the Texas State Board of Health. Since that date the State has turned over all quarantine operations

at this station and on the Texas-Mexican border to the United States Public Health Service.

On April 25 the international footbridge where all of the quarantine operations had been conducted for some time was destroyed by fire and it became immediately necessary to open up for traffic the international railroad bridge until such time as the owners of the destroyed bridge could build a pontoon bridge. In the meantime arrangements were made to run a shuttle train over the international railroad bridge and to operate this service between the two Laredos for passengers and baggage. Since the pontoon bridge was completed the traffic has been divided between the two bridges and the shuttle train continued in operation over the international railroad bridge once a day, conveying passengers and baggage to the United States, where all passengers are handled at the disinfecting plant of the United States Public Health Service. This building was finished in August, 1917, as described in the annual report of 1917 (p. 81), and was used after that date until April 13, 1918, as described in the annual report of 1918 (p. 182), when passenger-train traffic was discontinued on account of the unsettled conditions in Mexico. From that date international footbridge was utilized as the only place of entry, but since its destruction the international railroad bridge has resumed operation and now is open for passenger-train traffic, and it is believed will continue in operation, as arrangements are being made whereby within a few weeks trains will operate over the international railroad bridge and restore the regular traffic of the prewar schedule. This will greatly facilitate the handling of traffic.

The illegal entry of the laboring class—referred to on page 122 of the annual report 1919—by crossing the river other than at the regular port of entry, by wading the river or by row boats has been the cause of great concern at this station lest they would introduce some quarantinable disease into the United States. It is a well-known fact that thousands pass in this illegal manner on account of the vast stretch of border and the limited number of guards. A mounted quarantine guard was placed on duty January 17, 1919, to work along the river front in this vicinity cooperating with the Immigration Service guards and this has been of great assistance in stopping the irregular practice. During the past year hundreds have been apprehended and deported and of these illegal entries the majority of them are lice infested and many lame, cripple, and afflicted.

Night travel over the international footbridge has been restricted between the hours of 7 p. m. and 7 a. m. to all persons except those having a night quarantine pass. Since June 1, 1920, the period of restriction has been extended to 11 p. m., but only to those holding a regular border "admitted" permit, making the closed quarantine hours from 11 p. m. to 7 a. m. This privilege is not extended to those arriving from the interior of Mexico.

Marcus Hook (Pa.) quarantine station.—Surg. H. McG. Robertson in charge. In accordance with an act of the Pennsylvania State Legislature approved June 26, 1919, the State quarantine was discontinued July 1, 1919. The grounds, buildings, and equipment of the State quarantine station were, under this act, transferred to the Treasury Department at a nominal rental for a period of one

year, with the privilege of renewal. The floating property, consisting of a tug and a launch, was to be purchased by the Government at an appraised valuation.

On July 1 the State station at Marcus Hook was formally transferred by the State quarantine physician to the representative of the Public Health Service sent to take charge under the terms of the lease.

The personnel of the State quarantine, including the two deputy quarantine physicians, was transferred to the Public Health Service, with the exception of the senior officer and his office force in Philadelphia.

The quarantine station at Marcus Hook is situated about 17 miles below Philadelphia and accessible by train and trolley to that city and Chester. The reservation consists of 20 acres, extending along the Delaware River near the Delaware State line. There are three dwelling houses for officers, an office building with attendants' rooms upstairs, a barracks building that will accommodate with the present equipment about 100 persons, a hospital of 25 beds, an isolation hospital, a fumigating plant, and stables, garage, etc.

On July 1, 1919, the inspection of vessels at Reedy Island was discontinued, and since that time all vessels for Delaware River ports above the breakwater have been inspected at Marcus Hook. Vessels thus arriving for quarantine inspection are principally for Philadelphia, but many enter the following subports: Camden, Paulsboro, and Carney's Point, N. J.; Chester and Marcus Hook, Pa.; Claymont and Wilmington, Del.

The fumigation of vessels is done mainly at the Marcus Hook station, but a number are referred to an officer of the service in Philadelphia for fumigation after discharge of cargo.

The number of vessels arriving at quarantine during the year is approximately the prewar number for the Delaware River, but passenger traffic has not been resumed to any great extent. During the fiscal year less than 5,000 passengers were inspected at quarantine.

Only one vessel, the fruit steamer *Vestnorge*, from Santa Marta, Colombia, arrived during the year with a quarantinable disease aboard. This was a case of smallpox in a fireman. The disease was of a mild type. The patient and eight contacts were removed to the quarantine station, after which the remainder of the crew were vaccinated, the quarters disinfected, and the steamer released. Two of the contacts developed smallpox after 10 days at the station.

One vessel from a yellow-fever port was detained for 36 hours for observation of cases of fever aboard. The condition proved to be malarial fever.

The inspection of vessels is performed from sunrise until 10 p. m., but during the year not over 15 vessels were visited after sunset.

New Orleans (La.) quarantine.—Passed Asst. Surg. C. M. Fauntleroy, in charge, reports as follows: There were inspected at the station during the past fiscal year a total of 1,737 vessels, 69,078 seamen, and 11,238 passengers.

One case of yellow fever was observed at the station. No other quarantinable diseases were detected. The case of yellow fever was in the person of a first-class male passenger who arrived at the station on board of the steamship *Saramacca* on December 6, 1919.

The man was engaged in the insurance business and he had just completed an extensive trip through Salvador and Guatemala and was returning to his home at New Orleans. He was taken sick on December 3, the day after his departure from Puerto Barrios, Guatemala, on board of the *Saramacca* while en route to New Orleans. His condition became rapidly worse and upon the arrival of the vessel at quarantine the patient was found to be in an extremely critical condition, and he died at the station the following morning, December 7, 1919. The autopsy, which was performed by service officers on duty at the quarantine station, confirmed the diagnosis of yellow fever.

Two cases of chicken pox and a number of cases of malaria were removed from vessels arriving during the year and were held pending the results of physical and laboratory examination.

During the fiscal year 23 vessels were reported to the proper authorities for violation of the act of February 15, 1893, due to the failure of masters to present American bills of health upon arrival from foreign ports.

The medical inspection of alien seamen and passengers was continued at the station during the year in conjunction with the work performed by the immigrant inspectors who were detailed for duty at quarantine.

There were examined for immigration purposes a total of 42,562 alien seamen and 4,862 alien passengers. Of this number 469 alien seamen and 51 alien passengers were certified for various diseases and defects in accordance with the immigration laws and regulations. An account in detail of the medical inspections of aliens at the station will be found elsewhere in this report.

An increase in the detention facilities was effected by the removal of a large amount of excess property which had been stored for many years in the station hospital building, and the space thus obtained was converted into detention quarters to be used in case of emergency. The total number of beds now available for persons held in detention will closely approximate 150, distributed in three different buildings.

Pensacola (Fla.) quarantine.—Acting Asst. Surg. S. R. Mallory Kennedy in charge.

During the year there were inspected 210 vessels, 3,587 crew, and no passengers, showing an increase of 76 vessels inspected over last year, and 1,174 crew.

Forty-four vessels were fumigated. One was for rodent plague reported at the port of departure, and six for human plague reported at the port of departure. The rest were fumigated because of conditions prevailing at previous ports, and the fact that they had not been fumigated since touching at these ports, and instructions covered by bureau circular letters and telegraphic orders.

No quarantinable diseases were noted.

In November, 1917, the medical officer in charge was moved from the quarantine station located 8 miles up the sound to Pensacola, from which point all vessels have been boarded in the open bay about 2 miles from shore, the quarantine station being maintained only for detention should same prove necessary. This plan has proven most satisfactory, as the boarding can be done without delay, advance information being always obtainable by phone from Fort Barrancas, at the mouth of the harbor, as to whether or not vessels entering are flying the quarantine flag.

Toward the close of the fiscal year—on June 11—a case of bubonic plague was reported in Pensacola in the person of Peter Gardina, an Italian groceryman, who had been a resident of Pensacola all his life, living 2 miles from the water front.

The only vessel arriving in Pensacola from a known-to-be-infected port after the telegraphic instructions of June 1, bearing the information that plague was present in Vera Cruz, was the American schooner *Willis A. Holden*, from Vera Cruz. This vessel arrived at Pensacola on the evening of June 6 and lay at anchor 2 miles from the shore. The *Holden* was fumigated for rats on June 7; time of exposure, eight hours. The vessel was not boarded by the customs officers until June 8, and did not dock until late in the afternoon of the same day. In this connection it is interesting to note that Gardina had his initial chill 2 miles from the water front on June 9. The vessel had consumed two full periods of incubation plus three days on the voyage. All on board were well and no one on board had been ill.

On the morning of June 12 the quarantine officer caused all vessels lying at local docks to breast off 4 feet and to place rat guards on all lines. All coastwise shipping was fumigated with cyanide prior to departure and was issued a port sanitary statement, upon the face of which was stamped whether the vessel had or had not complied with all outgoing quarantine regulations. In the event that the vessel had failed to comply, this fact was at once telegraphed to the medical officer at the port where the vessel would first touch.

A breasting-off ordinance was presented to the city commissioners and passed, which enables the city authorities to prosecute offenders.

The medical officer in charge, in addition to administering the quarantine functions, had charge of the hospital and out-patient relief and the examination of aliens.

Port Townsend quarantine station, Wash.—Surg. Joseph Bolten, medical officer in charge, reports as follows:

Seventy-seven steamers were inspected and passed and 2 detained, and 19 sailing vessels were inspected and passed and 3 detained. One hundred and thirty-one steamers and 7 sailing vessels, bound for Seattle, Tacoma, and other Puget Sound ports, were granted provisional pratique, with the stipulation that they would be fumigated at those ports when empty, and the service officers at those ports were notified by wire and letter. These vessels carried a total of 15,606 members of crews and 7,176 passengers. One steamer, the U. S. Army transport *Dix*, was boarded and passed on the certificate of the medical officer, and one passed on the certificate of the medical officer and one steam schooner was spoken and passed. The American steamship *City of Seattle*, en route to Seattle from Sitka, Alaska, had one case of smallpox on board. The patient was landed at Juneau and the vessel ordered to Port Townsend, where the crew and passengers were inspected and the contacts, two cabin boys, vaccinated. The vessel was then allowed to proceed to Seattle. All detained vessels were fumigated with sulphur dioxide gas by the pot method for the destruction of rodents and vermin. The work was done in the Bay of Port Townsend. The United States Coast Guard cutters *Algonquin* and *Snohomish* were fumigated with cyanide at the quarantine station upon the request of their respective captains.

No vessels were detained at the quarantine station for smallpox during the year.

Two lepers were treated at the station during the year. One has been at the station since January, 1910, and is now totally blind. He is a marine hospital patient. The other, an alien, is being held for the United States Immigration Service pending deportation to Austria. She is confined to her quarters and has given very little trouble in the past year. Her condition remains about the same as when admitted in 1917.

A new boarding vessel was obtained to supplant the *Wightman*, which was transferred to another port. The new vessel, renamed *Bailhache*, has been overhauled and is now in commission.

Portland (Me.) quarantine.—Senior Surg. P. C. Kalloch in charge.

Owing to the appearance of smallpox in the Canadian Provinces during the past year, eight steamers were detained at quarantine and the crews were vaccinated. Five vessels from plague-infected ports were funigated for the destruction of rats and other vermin. The carcasses were collected and examined for plague infection, with negative results. No quarantinable diseases were observed during the year. One hundred and fifty-two vessels were inspected and a total of 2,980 passengers and 8,673 members of crews examined.

Presidio (Tex.) quarantine.—Acting Asst. Surg. W. C. Moore in charge.

This is one of the smaller border stations transferred from the control of the Texas State quarantine service to the Public Health Service on September 1 in accordance with arrangements for the sole control of all border quarantine by the service. Whereas formerly there was merely an inspection station, office space has now been provided and additional facilities for inspection and treatment of incoming travelers when necessary. Special attention has been paid to the prevention of the introduction of smallpox. With this object in view, 5,090 persons were vaccinated. On various occasions service representatives have assisted the local health authorities, both city and county, in measures for the control of local epidemics of nonquarantinable diseases, such as diphtheria and scarlet fever. Travelers from the interior of Mexico numbered 373 and local travelers inspected numbered 4,679.

In addition to the quarantine function, service representatives made medical examination of arriving aliens for immigration purposes.

Providence (R. I.) quarantine.—Surg. H. G. Ebert, in charge.

During the year 83 vessels were boarded for quarantine inspection as follows: Steamers, 66; sailing vessels, 10; and barges, 7. Two steamers were remanded to New York quarantine on account of smallpox among the passengers, the detention facilities at this station not being sufficient for the number of persons (244 crew and 1,760 passengers) on those ships.

A total of 4,017 crew and 13,538 passengers subject to quarantine inspection arrived and 3,773 crew and 11,778 passengers were inspected and passed. The remainder went to New York as above stated, 244 crew and 1,760 passengers.

Communicable diseases not quarantinable under the regulations were reported to the local health authorities as follows: Measles, 10 cases; chicken pox, 1 case. One case of fever was sent to the hos-

pital for observation and diagnosis and proved to be cerebrospinal meningitis. Two vessels were fumigated for the destruction of rats.

The fiscal year 1919-20 has had the largest number of quarantine transactions in the history of the station. The greatest number of vessels boarded up to this year was in 1913, when 43 vessels were boarded, the percentage of increase over that year being 93 per cent. The increase over the average of all previous years is 147 per cent.

It seems practically certain that the increase during the coming fiscal year will be much greater. This year the number of crew inspected was larger than in any of the previous years, while the number of passengers inspected has been much larger than in any previous year with the exception of 1913 and 1914, when the number only slightly exceeded that of this year.

Reedy Island (Del.) quarantine.—Post-office address, Port Penn, Del.; telegraphic address, Reedy Island, Del.; Attendant Charles N. McMunn in charge, under supervision of Surg. H. McG. Robertson, in charge of quarantine system on Delaware Bay and River.

Three vessels, with a total personnel of 103, were inspected and passed on July 1, after which date the inspection of vessels was discontinued at this station owing to the acquisition by the service of the Marcus Hook quarantine station from the State of Pennsylvania.

The station is held in reserve to care for vessels that may be remanded thereto for disinfection, and for detention of passengers and crews on account of quarantinable diseases. Accommodations for detention and treatment of personnel are available as follows: Barracks, 264 bunks; quarters for crews, 72 bunks and 18 beds; isolation hospital, 18 beds; general hospital, 13 beds; quarters on disinfecting pier, 34 bunks. Owing to the increased facilities afforded by the new barracks for the detention of personnel, as well as those now available at the Marcus Hook quarantine, the hulk *Lancaster*, formerly used for this purpose, is no longer considered necessary, and the matter of her transfer to another station of the service is under consideration. Thirty shower heads are provided on the disinfecting pier for bathing passengers and crews, and two large rectangular Kinyoun-Francis steam chambers, with formaldehyde attachment, for the disinfection of clothing, bedding, etc. Fumigation of vessels is accomplished with sulphur or cyanide.

During the year the new barracks have been equipped with 264 Gosso sanitary bunks, and kitchen equipment, consisting of electrical dish washer, electrical vegetable parer, steam vegetable cooker, steam coffee and soup urns, etc., has been received ready for installation.

Extensive repairs to the south ice breaker of the disinfecting pier, which were started during the preceding fiscal year, were completed. The entire top of the old wooden breaker was removed down to low-water mark and replaced with reinforced concrete.

The new 100-horsepower boiler purchased for use on the disinfecting pier has been installed, and the dynamo for the electric-lighting system transferred from the pier to the new laundry building.

Many minor repairs to buildings, gangways, plumbing, and equipment have been made during the year by the station force.

Riogrande City (Tex.) quarantine.—Acting Asst. Surg. G. W. Edgerton in charge.

The service maintains at this port a building wherein all necessary inspection and treatment of incoming travelers are performed. The

use of office space is also extended to the Immigration Service. During the year 82 persons were treated for the destruction of vermin, and a like number were vaccinated. In addition to the quarantine function, the service representative performs medical examination for immigration purposes.

Sabine (Tex.) quarantine.—Acting Asst. Surg. P. H. Chilton, in charge, reports as follows:

This station passed from State control to that of the United States Public Health Service on September 1, 1919, in accordance with the terms of lease between the State and Federal Government. In the sundry civil act of 1921 Congress provided funds for the purchase of Texas quarantine stations that were still owned by the State of Texas, of which number the Sabine station was one. Since September 1, 1919, Sabine has been operated as a national quarantine station. It is located on Sabine channel, and there inspection is conducted of all ships destined for Sabine, Port Arthur, Beaumont, Orange, and Port Neches. Most of the commerce of the Sabine Lake district is composed of vessels engaged in oil trade between Tampico and ports of the United States. During the last 10 months of the fiscal year 556 vessels were inspected, and of these 32 were fumigated with sulphur and one with cyanide gas.

The facilities of Sabine station are inadequate for detention of crews and passengers. The only Government-owned building is that of the quarantine officer's residence. The floating equipment consists of two launches, both in need of repairs.

In view of the lack of detention facilities, it would be necessary, should the occasion arise, to remand an infected vessel to Galveston. The importance of Sabine Lake ports is sufficient as to justify the establishment of a modern quarantine station at Sabine, including quarters for employees, detention barracks for crews, a landing wharf, and protection for launches.

St. Johns River quarantine.—Post-office and telegraphic address, Mayport, Fla. Acting Asst. Surg. F. R. Maura in charge.

During the year 159 vessels were inspected, containing 36 passengers and 3,876 crew. Eighteen vessels were fumigated for the destruction of rats, and, although only 90 rats were found killed, the total number was very probably greater, as conditions did not permit of a thorough search. Fumigation is performed by the pot and pan method, and sulphur is the agent used for fumigation. No quarantinable diseases were observed, and no vessels were detained except for the purpose of fumigation.

San Diego quarantine station, Point Loma, Calif.—Surg. J. R. Hurley in charge.

This station is located on the south side of Point Loma at the entrance to San Diego Bay; is situated about $1\frac{1}{2}$ miles from the western extremity of Point Loma; about 4 miles distance from San Diego by water and something over 7 miles by overland road.

The floating equipment consists of one steam launch 55 feet long and three rowboats of various sizes.

The buildings on the station include quarters for the medical officer and for the station force of attendants, a station hospital of normal capacity of 10 beds, two small isolation hospital buildings of 7 beds each, detention barracks for steerage passengers and ships' crews, a suitably equipped disinfecting dock with shower baths for

both sexes, boathouse, carpenter shop, a small office building, storehouse, and garage. There is also a large mess hall, with walls formerly partly formed by wire fly screening. This building, of flimsy construction, was erected by the Navy during the war, as was also the small office building. There is no building especially constructed and equipped for the detention of cabin passengers. However, the mess hall building above mentioned could, without difficulty and at no great expense, be remodeled so as to accommodate about 50 cabin passengers. The steerage passengers' barracks as at present arranged will house 50 persons; but with the addition of standee bunks could be made to accommodate 250.

All land on Point Loma from the quarantine station out to its western extremity is owned by the Government. That immediately adjoining the quarantine station is occupied by the Navy as a coaling station and wireless station. Farther to the west lies Fort Rosecrans, a small Coast Artillery post of the Army.

The quarantine station is almost ideally situated for its purpose, and no other place nearly as suitably located could be found in the vicinity of San Diego.

No quarantinable diseases have been observed during the year.

A total of 976 vessels entered quarantine during the year. Of these there were inspected and passed 864, with a total of 5,397 crew and 3,418 passengers. There were 112 naval vessels boarded and passed, hailed and passed, or passed by radio on medical officer's certificate during the year.

By request one naval vessel was fumigated with sulphur dioxide for the purpose of destroying vermin.

Cooperation rendered other Government departments:

The Lighthouse Service: Permission has been accorded this service to store a few spare can and spar buoys on the west end of the disinfecting dock pending the time when they will be needed; and the use of a station storeroom for the landing and temporary storage of lighthouse supplies has been afforded. The acetylene flashing light, also the fog bell located on the east end of the station dock has been appropriately started and stopped by a station attendant throughout the year.

Coast and Geodetic Survey: A tide gauge with automatic recording instrument attached is located in a small building adjoining the boathouse. This instrument is cared for and the recorded readings periodically forwarded to Washington by one of the station personnel.

United States Navy: Upon request of the commandant of the neighboring coaling station, emergency medical and surgical assistance has been rendered sick or injured marines or civilian employees of that station, also physical examination of a number of applicants for employment there have been made. Also emergency treatment has been given sailors on colliers and other small naval vessels lying alongside the coal dock upon request of their respective commanding officers, other medical assistance not being readily available in this locality.

San Francisco quarantine.—Surg. Frierich Simpson, in charge, reports as follows:

During the current year only one vessel has been detained in quarantine, namely, the American steamship *Broad Arrow*. Prior

to the arrival of this vessel this station was advised by wireless that on December 10, 10 days out of Nagasaki, Japan, an able-bodied seaman became ill and that the diagnosis of smallpox had been made. This vessel arrived at quarantine at 2 p. m. Sunday, December 21, and proceeded immediately to the station. She was at once boarded and the diagnosis of *variola vera* discrete confirmed. Immediately following the illness, the captain of the vessel isolated the patient and prevented further contact with the crew. The patient on arrival was immediately transferred to the station, isolated, and placed under the charge of a trained nurse. The crew, consisting of the captain and 41 men, were next removed ashore, vaccinated, and kept under observation until the completion of 14 days following last exposure to the case, when, no smallpox having developed, they were released.

The compartments of the ship, consisting of quarters, toilet, and messroom, occupied by the patient, were fumigated with formaldehyde gas and the remainder of the ship with cyanide gas. A new crew was placed aboard and the vessel allowed to depart. The patient continued under medical care until recovery on January 24, on which date he was discharged.

Cooperation with military authorities:

Cooperative work for the assistance of the military authorities on Angel Island and in charge of the transport service has continued. Semiweekly fumigations of infected clothing received from the hospital at Fort McDowell have been carried out. On August 22, 1919, 13 enlisted men, arriving from Siberia via Army transport, were received at the station, bathed, and their clothing deloused. On October 6, 500 men from Siberia, arriving via the transport *Thomas*, were received at the station, the personnel bathed, and the clothing deloused.

On February 26, 1920, in response to a request of the military authorities representing the Western Department, this station received for quarantine and observation the crew of the U. S. Army transport *Mount Vernon*, consisting of 510 men. This vessel had been regularly admitted to the port, but while undergoing repairs at the Mare Island Navy Yard a fireman, recruited from Napa County, developed smallpox and was isolated in the Mare Island Navy Yard Hospital. An indeterminate number of the crew had been exposed to this case prior to isolation. The surgeon in charge of the yard was without quarters for the isolation of the crew, and informed the War Department that their removal for observation would be necessary before the continuation of repairs. The military authorities, being unable to properly segregate and care for these men, requested their isolation at the quarantine station. They were received on short notice on February 26 and were released on March 4. No smallpox having developed during this period of isolation, they were discharged and returned aboard the transport, with the exception of six men from the fireroom, who developed epidemic parotitis and who continued isolated and under observation at the station until March 11, when they were discharged, recovered. The care of this crew, consisting of 510 men, was a severe tax upon the facilities of the station, and, the number exceeding the beds available, approximately 100 men were domiciled on various floors in selected buildings. This crew was reported as possessing an unenviable reputation, but without

military guard and under their own police supervision they reacted very satisfactorily to disciplinary measures and returned aboard with only minor charges of improper conduct.

Other cooperative measures included routine fumigations following the arrival of Army transports engaged upon oriental duties.

During the year, in addition to quarantine duties, quarantine boarding officers have assisted in the medical examination aboard vessels of all arriving aliens. Fifty-eight thousand five hundred and eleven passengers and 47,375 members of crews, representing a total personnel of 105,886, have been inspected, of which number 484 alien passengers and 51 alien members of crews were certified.

During the year 610 vessels have been fumigated, 482 with hydrocyanic acid gas, 127 with sulphur, and 1 with formaldehyde. This work has required the use of 36,782 pounds of sodium cyanide, 53,200 pints of sulphuric acid, and 56,910 pounds of sulphur. Forty-five vessels were fumigated by request, 33 being with cyanide and 12 with sulphur. The number of fumigations exceeds the previous fiscal year by 85 and shows a marked increase in the use of cyanide. In fact, although optional with shipping interests, cyanide is now the fumigant of choice, and in the majority of the 127 cases sulphur was resorted to because the hour of fumigation or the location of the vessel would not permit the use of cyanide. Notwithstanding the increased use of cyanide, no relaxation has been permitted in connection with the measures necessary to safe exposure of the ship. All personnel is removed ashore and certified to in writing by the master. No one among this personnel is allowed to return until the vessel has been personally inspected by a medical officer and its safety certified to over his signature. A fatality has occurred but once, in which case three ignorant Mexican stevedores were asphyxiated. An investigation by this office and by the coroner's office developed evidence to warrant the belief that these men purposely secreted themselves aboard to escape duty, and, being ignorant of the nature of the gas, failed to go ashore when warned.

As a result of fumigation work 3,004 rats and 620 mice were found and identified, as follows:

M. Norvegicus	6
M. Rattus	716
M. Alexandrinus	1, 676
Unidentified	606
Mice	620

Of this number of rodents obtained, 1,464 were transmitted to the laboratory for examination, and a report received as follows covering such examination:

Ships from which rats were obtained	112
M. Norvegicus examined	12
M. Rattus examined	455
M. Alexandrinus examined	997
Total	1, 464
Plague-infected rats found	0

San Pedro, Calif.—Acting Asst. Surg. G. T. Van Voorhees, in charge:

During the fiscal year there has been a very marked increase in transactions at San Pedro, which is the port of entry for Los Angeles. There were inspected 368 ships in contrast to 140 for the

previous year. The only quarantine facilities at San Pedro consist of the barge *Disinfector*, which is principally used for the storage of fumigation materials; but there is sufficient space for detention of two or three persons. The increase in shipping in this port harbor would justify the establishment of a quarantine station with adequate equipment for treating infected ships and personnel.

Daily inspection is maintained of all foreign ships for the purpose of enforcing the requirements of fending off vessels and of rat-guarding lines. The service officer at San Pedro also makes medical examination of aliens and extends relief to service beneficiaries.

Terlingua, Tex.—Acting Asst. Surg. R. A. Wilson, in charge, reports as follows:

This station is located in the extreme southern portion of the Big Bend district, midway between Santa Helena and La Jitis, and it is through these two latter places that travelers enter this district. Across the river from Santa Helena the Mexican Government maintains a garrison of about 500 troops. There is some illegal crossing, but the country is sparsely settled and the clandestine crossings are believed to be not common. Most of the work in this station consists of vaccination of the travelers from Mexico. Inspection of travelers is made for the purpose of excluding any infectious or contagious diseases. Very few louse-infested persons have been observed.

Transactions at foreign and insular stations for fiscal year ended June 30, 1920.

Stations.	Total number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected
Aguadilla, P. R.	9	0	108
Amoy, China.	32	.....	11,633
Arecibo, P. R.	3	.....	53
Arroyo, P. R.	6	.....	154
Callao, Peru.	224	83	37,668
Cavite, P. I.	21	.....	2,307
Cebu, P. I.	34	111	1,719
Christiansted, Virgin Islands.	4	.....	35
Fajardo, P. R.	18	0	114
Frederiksted, Virgin Islands.	32	.....	3,514
Guanica, P. R.	90	0	4,226
Guayaquil, Ecuador.	100	75	.....
Habana, Cuba.	2,409	22	178,532
Hilo, Hawaii.	41	36	1,359
Hongkong, China.	414	.....	.....
Honolulu, Hawaii.	683	72	172,543
Humacao, P. R.	0	.....	.....
Iloilo, P. I.	46	251	2,471
Jobos (Aguirre), P. R.	0	.....	.....
Jolo, P. I.	46	0	3,490
Kahului, Hawaii.	14	1	408
Koloa, Hawaii.	2	.....	47
Lahaina, Hawaii.	5	.....	325
Mahukona, Hawaii.	2	.....	18
Manila, P. I.	776	171	127,594
Messina, Italy.	69	.....	775
Naples, Italy.	226	.....	89,790
Olongapo, P. I.	3	.....	130
Palermo, Italy.	45	.....	17,547
Ponce, P. R.	109	.....	11,513
Port Lobos, Mexico.	231	28	14,397
Progreso, Mexico.	339	125	13,946
Puerto Mexico, Mexico.	6	4	194
St. Thomas, Virgin Islands.	273	1	15,309
San Juan, P. R.	468	13	48,834
Shanghai, China.	345	37	66,791
Tampico, Mexico.	339	339	.....
Tuxpam, Mexico.	91	10	5,804
Vera Cruz, Mexico.	63	5	4,542
Zamboanga, P. I.	21	.....	3,077
Total.....	7,639	1,384	882,051

FOREIGN AND INSULAR QUARANTINE.

AMOY, CHINA.

Acting Asst. Surg. E. J. Strick reports as follows:

General health conditions at Amoy have been somewhat better than in previous years. Bubonic plague, which has ravaged Amoy and vicinity every year since 1896, has shown a marked decrease during the summer of 1919. There were many deaths from cholera, but the epidemic was much milder than in Foochow and Shanghai. There were numerous deaths from cerebrospinal meningitis, smallpox, measles, whooping cough, malaria, and tuberculosis endemic, but it is impossible to furnish statistics, because, with no health department in Amoy, no records are kept. During the year there were inspected 32 vessels bound for the United States or its possessions. Six thousand eight hundred and sixty-nine steerage passengers were bathed and inspected, their baggage and personal effects disinfected. Two thousand three hundred and three members of the crews were similarly treated.

CALLAO, PERU.

Acting Asst. Surg. J. L. Castro-Gutierrez reports as follows:

During the year 224 vessels destined for ports of the United States or its possessions were inspected and appropriate treatment applied. Eighty-three vessels were fumigated prior to departure for the destruction of rats or mosquitoes. Nineteen thousand eight hundred and fifty-one members of crews and 17,807 passengers were inspected. Amongst the latter one was refused permission to embark because of suspected plague and one sick with diphtheria. Three thousand five hundred and forty-six persons were vaccinated because they came from localities infected with smallpox. During the calendar year of 1919 there were in various districts of Peru 654 cases of plague. This indicates that it is less prevalent than in previous years, but the decrease apparently is due to the operations of natural causes rather than to any effective antiplague measure.

After many years of freedom from infection, yellow fever again appeared at Tumbez and Piura, and despite the application of control measures there occurred during the first part of the fiscal year 131 cases, with 41 deaths, and during the last part of the fiscal year 400 cases.

Investigation indicates that the first case of yellow fever in Peru occurred at Tumbez on the 6th of December, 1918, in the person of a commercial agent from Guayaquil, and from this case the infection has spread to a number of localities in Peru. In June, 1919, the first case was reported in Piura, later on at Payta, at Sullana, and various other sections of the country.

The general health conditions of Peru are not good. Tentative plans have been made for the sanitation of 32 principal cities, but the work has so far been held in abeyance pending financial arrangements. The death rate at Lima was 30 per 1,000.

HABANA, CUBA.

Acting Asst. Surg. Richard Wilson reports as follows:

The functions of this office include: (1) Issuance of bills of health to vessels destined to ports of the United States or its possessions; (2)

inspection of vessels, crews, and passengers as required, and application of measures in accordance with the United States quarantine regulations; (3) reporting sanitary conditions of the city and surrounding country; (4) medical relief to American seamen to such an extent as may be practicable.

During the year bills of health were issued to 2,409 vessels, carrying 116,071 members of crews and 62,461 passengers. There were 22 vessels fumigated by the service force and 188 by the Cuban authority, under supervision of the service representative. Fumigation certificates were issued to this latter group of vessels in the same way as to vessels fumigated by service force. During the year an epidemic of smallpox broke out in Habana, as a result of which vaccination was enforced against passengers going to the United States or to the Canal Zone. The first case of smallpox was apparently introduced in Habana by an immigrant from Spain. Intensive vaccination was enforced by Cuban sanitary authority, and in two months the infection was apparently eradicated.

The quality of the water supply in Habana was about the same as in former years. It is insufficient in amount throughout the year, and during the summer months, in addition to the inadequacy, the supply of water is very dirty, and this results in numerous complaints published by the newspapers. The greatest number of sick reported were from malaria, of which there were 1,025 cases, with 24 deaths.

There were 926 cases of grippe, including 147 deaths; 734 cases of measles and 24 deaths; 100 cases of scarlet fever, 17 deaths; and of diphtheria there were 83 cases, with 10 deaths; of typhoid fever there were 653 cases, including 125 deaths; and there were 140 cases of chickenpox, with 2 deaths.

Harbor strikes continued throughout the year with more or less intermittency. Shipping was seriously affected by these strikes, and relief was sought by the use of volunteers, consisting of clerks, merchants, etc. Soldiers and prisoners were also utilized to remove the congestion of freight. Martial law was proclaimed and was enforced from February 1 to March 24. Vessels that might otherwise have been discharged in a few days were held up for several weeks, some for two months. As a result of inability to discharge cargo, the bay was filled with vessels at anchor, awaiting opportunity to discharge cargoes. The idle crews went ashore and through drinking and other indiscretions there has been a marked increase in the number of cases applying for medical relief at this office. One hundred and six sick seamen were sent to the hospital for treatment and 102 were treated in this office.

Office space has been insufficient and the accommodations for the treatment of sailors have been inadequate. There should be additional floor space, another medical officer, better water supply, provisions for the disposal of surgical dressings and slop water, and these improvements are most essential if the Public Health Service is to continue in administering medical relief to American sailors in Habana.

OPERATIONS OF THE SERVICE IN HAWAII.

National quarantine operations in the Hawaiian Islands, as heretofore, have been carried on at the port of Honolulu and the subports of Hilo, Mahukona, Koloa, Lahaina, and Kahului.

During the year seven vessels arrived at Honolulu with a history of quarantinable disease during the voyage. The steamship *Siberia Maru*, entering August 26, 1919, reported that a member of the crew suffering from cholera had been removed at Hongkong; passengers and crew had undergone detention for a period of five days, had been examined for carriers, and the vessel had been disinfected. No further cases having developed, the vessel was granted free pratique upon her arrival at Honolulu.

The United States Army transport *Logan* on October 9, 1919, and again on May 6, 1920, entered quarantine with a case of smallpox aboard, the victims being enlisted men. In each instance the patient was isolated, the quarters disinfected, and all susceptible contacts held the required period for observation.

On May 23, 1920, the steamship *Korea Maru* reported that a case of smallpox had been removed at Nagasaki and a second patient at Yokohama, the vessel having been disinfected. Pratique was granted at Honolulu, but the unvaccinated local passengers were detained to complete 14 days from the last exposure.

A member of the crew suffering from smallpox was removed from the steamship *Colusa* at Singapore on April 23, 1920. This vessel reached Honolulu 32 days later without having had secondary cases, consequently she was immediately cleared.

When two days out from Seattle an unvaccinated mess boy on the motor vessel *Pioneer* became ill of an eruptive disease which the captain considered smallpox. The ship made Honolulu 19 days later and the diagnosis was confirmed. The vessel was disinfected and two unvaccinated contacts were held for observation.

The only remaining quarantinable disease occurring was a case of leprosy in transit, the passenger traveling under prescribed regulations.

COMMUNICABLE DISEASES ON ARRIVING VESSELS.

In spite of the continuance of the influenza epidemic and the greater number of vessels inspected, a decrease in the incidence in communicable disease observed at quarantine was noted during the year. A total of 113 vessels, 15 per cent of those inspected, had communicable diseases aboard. The infections were as follows: Influenza, 261; tuberculosis, 119; pneumonia, unclassified, 84; mumps, 54; gonorrhea, 39; measles, 34; chancre, 21; malaria, 15; syphilis, 10; chicken pox, 9; typhoid, 6; miscellaneous, 17. In addition there were 14 cases of beriberi diagnosed.

Influenza among passengers or crew was reported on 29 arriving vessels, the largest number of cases on any one vessel being 60. The disease manifested itself principally between January 15 and April 15, the infection continuing later on vessels from oriental ports, especially China, than those from the States.

Of the 84 recorded cases of pneumonia mentioned above, 34 resulted fatally, indicating a relative high mortality, or, what is more probable, the noncomplete reporting of the cases which developed. In addition to the mortality referred to, there were 44 other deaths, attributable to numerous causes, among the personnel of arriving vessels.

DISINFECTION OF VESSELS.

The fumigation at regular intervals of vessels engaged in trade between the islands has been continued, both at the ports of Honolulu and Hilo, with satisfactory results. A total of 42 interisland vessels was so treated during the year. It was noted that the rat population of one of the wharves where these vessels touch increased over the normal, this condition being traceable to the long-continued storage of cereals thereon, a situation now remedied.

The systematic fumigation of trans-Pacific vessels at San Francisco when cargo has been discharged necessarily relieves this station of considerable work in this line. However, those vessels which discharge at Hawaiian ports are subject to treatment, 36 vessels of this character having been treated during the year.

The quarantine restrictions against vessels arriving from Mexico and Central and South American ports, where sanitary conditions are questionable as regards yellow fever, have been imposed and ships in this class have been held outside the harbor until fumigated for the destruction of mosquitoes, 29 vessels having been so treated.

The usual rat guard precautions have been maintained throughout the year and the system of daily inspection continued, in order to see that the master of every arriving vessel adheres strictly to the requirements.

AID TO GOVERNMENT SERVICES.

During the influenza epidemic, at the request of the Territorial board of health, the quarantine station was made available for the reception of patients for whom other suitable hospital accommodations could not be provided. A total of 25 patients, nearly all of whom were afflicted with pneumonia, was so received, the majority of these cases being removed from incoming vessels. There were seven deaths.

The remains of six persons, all of whom died from leprosy, were cremated at the station crematory upon request of the Territorial board of health. The preparation of culture media for the same organization, and providing guinea pigs for experimental purposes has been continued as in previous years.

Seventeen beneficiaries of the service, ineligible for treatment in the regular contract hospitals because of the fact that they were suffering from contagious diseases, were isolated and cared for at the quarantine station during the year.

EQUIPMENT.

The two boarding launches, the *Oahu* and the *Pelican*, have rendered satisfactory service considering their condition, but the time has arrived when the *Oahu* must be replaced by a more substantial boat. This launch was condemned by the Navy Department 20 years ago; that she has rendered efficient service in all sorts of weather and in rough seas for such a period of time speaks well for the care and attention she has received.

Owing to the lack of an appropriation the disinfecting chambers, boilers, and other machinery, which were taken down upon the trans-

fer of the quarantine wharf, have not been reinstalled. Necessarily the station will remain handicapped until this situation is corrected.

STATION IMPROVEMENTS.

All improvements, with the exception of driving the pilings for a new boat landing which was completed during the fiscal year, were undertaken by the station force. The wharf-fender system and decking were covered with two coats of hot asphaltum and sand, and the boilers and machinery housed on the quarantine wharf were cleaned and painted to aid in their preservation. New concrete gate posts were installed at the entrance of the station. The steel I beams under the runway leading from the quarantine wharf to the station were wire brushed and given two coats of red lead. The electric light poles which had become badly worm eaten were replaced by heavier and more substantial structures obtained from the old wharf dolphins. A new system of electric lights has been installed in one set of quarters and the wooden floor of the garage has been replaced by one of cement. All station buildings are in process of painting, this treatment being preceded by repairs to lanais, steps, and flooring, necessitated through the destructive activities of white ants. The roofs of all buildings have similarly been treated with green shingle stain, greatly adding to the attractiveness of the station. The cement sea wall surrounding the station, which has been disintegrating through oxidation of the reinforcement and a resulting splitting of the cement, is undergoing renewal. All roads about the grounds have been maintained in good repair through the renewal of the top dressing from time to time. In addition the machine shop has been equipped with a new lathe and drill press.

RAT CAMPAIGN AT HONOLULU.

In connection with the Territorial board of health, the trapping and examination of rodents have been carried on as heretofore, the recent recrudescence of plague at ports in the United States and elsewhere adding to the importance of this precautionary measure. A total of 14,055 rodents, rats, mongoose, and mice was captured during the year, of which number 13,851 were trapped, found dead, or shot, while the remainder were obtained from the fumigation of vessels. Upon examination none of these rodents was found to be plague infected.

PLAGUE ON THE ISLAND OF HAWAII.

The continuance of plague in the Hamakua district of the island of Hawaii, in spite of all precautionary measures, is to be noted. The Territorial board of health, in cooperation with the plantation owners, as in previous years, has exercised an energetic campaign for the eradication of this nidus of infection, but the physical handicaps are of such a nature that these efforts have not been accompanied with success, although unquestionably the danger of the dissemination of the disease, both to man and rodents, has been lessened. The fact that no human cases of plague occurred in the previous year, and only one infected rodent was discovered, gave rise to

encouragement, but the recrudescence of the past 12 months would seem to indicate that the infection has not been eradicated and is as formidable as at any previous time.

Eleven human cases of plague, all resulting fatally, developed during the year, constituting the greatest number which has occurred since 1910. Most of the victims were laborers employed on the various plantations of the Hamakua coast, and all of the cases, with one exception, were of the bubonic type.

There were 159,054 rodents captured during the 12 months' period, approximately 55 per cent of which were *Mus musculus*. Of the remainder *Mus rattus* predominated, with *Mus alexandrinus* next in proportion; a considerable number of mongoose—an average of 100 a month—were also taken. Examination revealed 23 plague-infected rodents, 13 of which were diagnosed during the month of September.

ITALIAN PORTS.

Acting Asst. Surg. Enrico Buonocore, stationed at Naples, reports as follows:

It is an established fact that the war favored the introduction and spread of epidemic diseases. It is also well known that a number of these diseases were reported more or less from all quarters, but that epidemics, in the true sense of the word, were unknown in those areas where proper sanitary precautions were taken.

Of the Mediterranean nations, Italy is nearest to the Levant and the Far East, and its ports are the first ports of call for ships from the east with cargo of grain, cotton, jute, and other raw materials.

As a rule, the preventive measures taken may be considered satisfactory, in that, notwithstanding scattered cases of typhus fever and a few cases of plague, no epidemic foci were formed in Italy.

The success of these measures can be appreciated, as regards Naples, when one considers the vast quantity of rats (*M. decumanus* and *M. rattus*) with which the port is infested; the lack of a regular service for their destruction, the almost complete absence of any rat-proofing system (except in the most modern constructions), and the futility of the measures adopted to prevent the travel of rats between the ships and the shore.

Although typhus fever and bubonic plague were held in check, smallpox spread throughout Italy. The great movement of disbanded troops, the return of prisoners of war, the revival of trade relations, and the large number of individuals unprotected by vaccination were the means by which the disease was spread. In Italy vaccination is prescribed by law, as well as the reporting of cases to the local sanitary authorities, but the breach of this law is followed by little or no punishment. During the war there was a falling off in the activities of the municipal sanitary authorities, due to the lack of personnel, an antivaccination campaign carried on by a certain school of medicine (Ruata), and the concealing of cases among the ignorant classes whenever the sanitary authorities enforce energetic prophylactic measures. All these causes, together with a lack of cleanliness in many districts, create favorable conditions for an epidemic. In general, the victims of the disease were most numerous among infants and children, though there was no lack of fatal

cases in old people 70 to 80 years of age. Notwithstanding the notable decrease in the disease, the marked virulence of the infection continues, due probably to the introduction of a new strain from the Orient.

On the termination of the war a large emigration was foreseen, consisting of Italian reservists returning with their families to America and of those who during the war were prevented from emigrating to the United States. There were also expected at Italian ports numerous Levantine emigrants, so much so that one of the Italian steamship lines instituted a regular service from Constanta, in Roumania, via Constantinople and Naples, to New York.

Considering the sanitary conditions before mentioned, it was consequently necessary that the activities of the service should be directed to prevent the spread of smallpox, typhus fever, and plague into the United States, and in order to effect this it was necessary to have prompt and precise information as to the presence of these diseases. Such information was often obtained through official channels and sometimes from reliable private sources.

SMALLPOX.

Smallpox was introduced in the summer of 1918 and spread over all Italy with the exception of Sardinia, assuming epidemic form in several Provinces of southern Italy (Bari, Lecce, Naples, Potenza) and Sicily (Messina, Palermo, Trapani).

Usually emigrants embarking at Naples for the United States come from southern Italy and Sicily, while those that leave Palermo are entirely Sicilians. In the month of July, 1919, the Italian Government established a concentration camp at Naples for Italian reservists coming from all parts of Italy. It was, therefore, easy to find people from places free from smallpox mixed with those from localities slightly or gravely infected. This being the case, the officers of the service at Naples arranged with the civil and military sanitary authorities that the reservists and their families should be vaccinated on their arrival, their bedding and effects stored in an isolated building and disinfected at the time of their embarkation for the United States.

By reason of the precautionary visit required by the American consul before viséing the passports of Italian reservists, the service officers cooperated with the Italian sanitary authorities in the inspection and medical treatment of the reservists. Among the many thousands of persons who passed through the concentration camp, only one case of varioloid was registered.

For the ordinary emigrants vaccination was obligatory, and was also extended to the second-class passengers, who with few exceptions are emigrants with a little more money. The disinfection of the baggage and bedding of both steerage and second-class passengers was carefully supervised.

TYPHUS FEVER.

The wave of typhus fever which swept over Italy had its origin in the prisoners taken after the defeat of the Austrian Army, and was contributed to by the return of Italian prisoners of war from the prison camps of Galicia, Serbia, Bosnia, and Herzegovina.

The centers of contagion remained confined to the concentration camps of the Austrian prisoners, but here and there cases occurred among the civil population in several municipal districts and even in some of the large cities.

The most serious menace came from the reservists, most of whom, if not all, carried with them and jealously guarded the uniforms (more or less vermin infested) as reminders of the dangers and hardships suffered during the war.

The difficulty in applying preventive measures would have been less if the reservists had all been for the United States, where they had been accustomed to cleanliness not only in themselves but also as regards their clothes. The danger lay in the reservists for the Levant, Asia, and the north of Africa, both dirty in their persons and in their dress.

The service officers in cooperation with the Italian sanitary authorities established the requirement that on the entry of the reservists into the concentration camp and after vaccination their uniforms and ordinary clothes be disinfected, their hair cut, and when necessary their heads were anointed with 1 per cent anethol. A period of 14 days observation was established, which later was prolonged to 21 days by an order of the Italian Government. The baggage of the reservists for the United States was disinfected a second time on the day of sailing paying special attention to the uniforms.

RAT PLAGUE.

During the war the necessity for a regular supply of wheat and other cereals caused increased communications between Mediterranean ports and those of the Far East, the home of plague in man and rodents. It was therefore only natural that rat plague should show itself in these ports, and Naples was one of the ports where the disease appeared. The course of the pestilence was marked by waves of infection alternated by more or less prolonged periods of quiescence.

The main focus of infection in Naples appears to be the bonded warehouses (Punto Franco), but, notwithstanding the large number of laborers employed there, no case of human plague was reported during the fiscal year either at the wharves or in the mills where the grain from these warehouses is ground.

The Italian sanitary regulations prescribe the fumigation of all vessels coming from plague-infected ports after they have discharged their cargoes, and this is performed with sulphur dioxide. A notation is placed on the bills of health of all ships leaving Naples for the United States recommending fumigation at the port of arrival.

EMIGRATION FROM THE LEVANT.

On the termination of the war emigration from the Levant to the United States was resumed, part of the emigrants embarking at ports in the Levant (Constanta, Constantinople, Smyrna, Piraeus), and others taking ship at Naples.

The officers of the service in cooperation with the Italian emigration authorities decided that Levantine emigrants embarking at Naples for American ports should be held in observation in a sep-

arate building at the Casa degli emigranti for 14 days, and later, by an order of the Italian authorities, for 21 days. On entering the Casa degli emigranti they were bathed, their hair cut, if necessary, their clothes and all their baggage disinfected. Eight hundred twenty-four were subjected to these operations before embarkation. The Italian Government decided that all vessels embarking emigrants in Levantine ports and coming to Naples to fill their complement with Italian emigrants should, before embarking passengers, remain three days in port, the Levantine emigrants being held on board. During this period the officers of the service inspected the crew and passengers.

On May 4, 1920, by an order of the Italian commissioner of emigration, all vessels with steerage passengers from the Levant were prohibited to embark Italian emigrants at ports of the Kingdom, and on May 15, 1920, this prohibition was further extended to Levantine emigrants sailing from Italian ports.

OUT-PATIENT OFFICE.

The out-patient work for the fiscal year has been limited to the crews of American ships, a steadily increasing number of which call at Naples and other ports on the bay. The sick from these ships call at the American consulate for treatment, and when necessary an officer goes on board. Both officers and men of these vessels frequently express their appreciation of the advantages thus offered them. The consul has also tendered grateful thanks for this service.

Acting Asst. Surg. R. Mazzaccara continued on duty at the American consulate at Messina and supervised service operations against shipping, both at Messina and Palermo. At these two ports were inspected throughout the year 114 vessels, with a total of 18,322 passengers and crew.

OPERATIONS OF THE SERVICE IN THE PHILIPPINES.

Passed Asst. Surg. L. R. Thompson, chief quarantine officer, reports as follows:

The method and procedure followed out by the quarantine service in the Philippines during the year 1919-20 has been practically the same as in previous years, and the service acted in complete harmonious accord with the Bureau of Health and the various shipping interests, both foreign and national. In every way possible the service attempted to reduce to a minimum such inconveniences as might serve as a delay to both passenger and freight vessels entering the various Philippine ports, and it is noteworthy to state that there has been a decided effort on the part of the shipping interests to willingly comply with all the quarantine measures which it has been necessary to institute to prevent the entrance of the various quarantinable diseases into the Islands.

ASPECT AND ACTIVITIES.

The various duties which the United States Public Health Service is required to carry on in operating the bureau of quarantine service in the Philippine Islands are as follows: (1) National quarantine,

(2) consular quarantine, (3) interisland quarantine, (4) immigration inspection, (5) sanitary supervision of vessels and ports, (6) physical examination of applicants for marine licenses and other Government positions, (7) miscellaneous functions.

GENERAL SCHEME OF OPERATION.

As there has been no change during the year in the number of ports in the Philippine Islands at which foreign vessels may make entry, there has been no change in the location of quarantine stations. At present quarantine officers are stationed at the ports of Manila, Cebu, Iloilo, Zamboanga, Jolo, Cavite, Olongapo, and Mariveles. At all of these stations inspection of passenger and freight vessels are made by officers of the service, and disinfection and fumigation can be instituted when in the opinion of the quarantine officer such measures are necessary. As in the past, however, the service maintains but two fully equipped stations for disinfection of baggage and freight by steam and where there are sufficient housing facilities and adequate quarters for the segregation in quarantine of the personnel and passengers of both freight and passenger vessels entering Philippine waters. The station for Manila is located at Mariveles, near the entrance to Manila Bay, and is well placed to take care of the entire shipping of the northern islands. The station at Cebu is centrally located for all shipping going to the southern islands.

As in past years, foreign vessels entering the port of Manila are not required to stop at Mariveles for primary inspection unless they have on board a recognized quarantinable disease. Under these regulations all vessels are inspected directly at the port of Manila, thus saving considerable loss of time and inconvenience to incoming vessels.

SANITARY CONDITION OF THE ORIENT.

During the year there was an enormous increase in shipping between the Philippine Islands, the United States, and various oriental ports; in fact, the tonnage entering the port of Manila practically doubled itself over that of the preceding year. To meet the increased shipping, the quarantine service has increased its facilities in order to minimize as far as possible loss of time to passenger and freight traffic passing through Philippine ports, and the service has at all times stood ready to aid American and other business interests in making Manila the central port of the Orient through which American merchandise passes to other oriental ports. To a large extent the quarantine procedure carried on at Manila has depended upon the prevalence of various quarantinable diseases at the ports touched by the incoming vessels. The thoroughness and sanity of this method of quarantine procedure is unquestionably shown by the fact that no quarantinable disease gained entrance into the Philippine Islands during the past year.

Of special interest to Manila has been the prevalence of typhus fever at the port of Vladivostok, on account of the fact that the American Army of occupation in Siberia was ordered to Manila when the military operations in Siberia came to an end. In con-

ference with the department surgeon of the Philippine Department. it was arranged that all American soldiers embarking for the Philippines would be completely deloused under the supervision of Army medical officers before boarding the transports. By this method of procedure the danger of the entrance of typhus fever into the Philippines was greatly lessened. Several cases of typhus fever developed among the passengers on these transports, but in each instance it was found that the infection had occurred prior to the delousing of the patient, so that the danger of spread to other passengers on the vessels was of a minimum character. At the final embarkation the transport *Crook* was used as a hospital ship to return all cases of disease, including smallpox and typhus fever, to Manila. Cases of quarantinable disease were hospitalized and kept under observation until fully recovered. The vessel itself was completely fumigated and disinfected before being allowed to return to passenger service.

During the year it was necessary to impose certain stringent regulations regarding vessels entering Philippine ports from near-by Oriental ports at which cholera and plague were present in epidemic form. In the case of cholera these vessels were required to complete the regular five days' quarantine and stools of passengers and crews were examined for detection of cholera carriers before the vessels were given free pratique. With regard to plague, all vessels were required to be completely fumigated for the destruction of rats on each trip to Manila, and special inspection of rat guards was required during the time the vessel laid at the piers. Vessels carrying through cargoes and touching at several Philippine ports were required to be fumigated before taking on their cargo.

As in the year previous all vessels of Philippine registry engaged in both foreign and interisland trade were required to be completely fumigated on their return from a foreign port and before entering the Pasig River at Manila. This restriction was believed necessary in order to prevent the possible escape of infected rats to interisland shipping.

QUARANTINABLE DISEASES.

Compared to the amount of shipping which entered the Philippine ports during the past year, the number of vessels on which quarantinable diseases were found has considerably decreased over previous years. To some extent the reason of this decrease may be found in the betterment of the sanitary conditions throughout all oriental ports, but to a much greater extent the reason lies in the precautions which masters and agents have taken when the vessels arrived at an infected port to prevent the entrance of the infection to the personnel of the ship.

Interisland vessels without illness on board were not subjected to quarantine inspection even when coming from other infected ports in the Philippines. However, any case of illness, no matter of what character, required the vessels to report to the nearest quarantine station for official inspection and necessary treatment. A not inconsiderable number of these vessels are treated each year, the usual cause being smallpox and cholera.

INCOMING QUARANTINE.

Up to the present time there has been no change from the usual hours of inspection, namely, from sunrise to sunset, as it has been thought that the completeness and accurateness of daylight inspection, especially of vessels maintaining oriental crews far offsets the inconvenience and loss of time to the vessels entering during the night. However, it has been seriously considered that it might be of some benefit and aid to shipping interests if the hours of quarantine inspection of vessels entering Philippine ports direct from the United States were lengthened to 10 p. m. It is expected that this matter be taken up with the various shipping interests during the coming year, and if in their opinion such a procedure would constitute a considerable aid to shipping, the hours of quarantine will be extended.

The chief quarantine officer was called in conference by the Governor General regarding the necessity of imposing special quarantine regulations on vessels arriving from China and Japan to minimize the entrance of influenza into the Philippine Islands at the time when the disease was prevalent in epidemic form in those countries. It was thought that to impose any special quarantine regulations on such vessels would tend to work a considerable hardship on shipping into the port of Manila without being of any special benefit. Therefore it was decided that unless the vessel presented evidence that influenza was epidemic on board the passengers would be allowed to land without restriction; all cases of influenza, bronchitis, pneumonia, and other allied diseases, being reported to the director of health and being kept on board until provision could be made for their care and quarantine by the health service.

CONSULAR QUARANTINE.

The protection of those ports of the United States with which the Philippine Islands have considerable trade, and the protection of the United States vessels and other shipping while in Philippine ports, constitutes one of the most important functions of the quarantine service in the Philippine Islands.

During the epidemic of smallpox at Manila and other ports none of the personnel of American ships were allowed on shore unless previously vaccinated.

In the months of July, August, September, and October cholera appeared in Manila in epidemic proportions, reaching at its height approximately 100 cases per week. With the advent of this epidemic it was necessary to impose rather severe regulations on all American shipping, and the same regulations were also applied to all vessels bound for the United States ports. Masters and agents were notified that under no circumstances would they be allowed to take aboard fresh vegetables, fruits, and such other classes of foods as would be eaten raw.

Communication between the vessel and the port of Manila was restricted as far as possible to the officers and those of the crew who were required on shore in carrying out the actual business of the vessel. All third-class passengers bound for the United States were required to have stool examinations made for the detection of cholera carriers. The same regulations also applied to the troop class on the United States Army transports.

The effect of these regulations in preventing smallpox and cholera from breaking out among the personnel and passengers of vessels touching at Manila can not be questioned, since this office has record of only two vessels on which quarantinable diseases developed after leaving Philippine ports.

FUMIGATION AND DISINFECTION.

As fumigation is essentially an antirat measure, its employment with regard to foreign shipping has largely depended upon the evidence of plague in the ports from which the vessel came. During the season when plague was present in epidemic form, fumigation was required each trip, while at the other periods of the year fumigation was required every three months of all vessels touching Manila on regular runs.

All interisland vessels are required to be fumigated twice yearly. At the same time a complete inspection of the vessel is made by an officer of the service, including a complete investigation of the sanitary condition of the kitchen, ice boxes, baths, toilets, staterooms, and other parts of the vessel. As a matter of fact, fumigation of all interisland vessels, while primarily an antirat measure, is more largely directed toward the destruction of the various classes of vermin which infest these boats, and it has been found that the combination of the fumigation and inspection has tended materially toward the general comfort and good service as it affects passengers.

IMMIGRATION INSPECTION.

Examinations of aliens are made by the officers of the service on shipboard, at the immigration station, and at the office of the quarantine service when the aliens are presented by the immigration officials for examination. Rejections are usually due to favus and trachoma. Favus is very prevalent among the children of certain domiciled aliens who are being newly brought into the Philippines, and at each inspection from 5 to 15 cases of these diseases are found.

In accordance with the immigration regulations these children are allowed to enter Philippine ports, but are required to be placed under bond and have treatment until a cure can be effected.

No special officer was detailed for immigration duty in the Philippines, the work being carried on in connection with the general quarantine work.

DOCK AND BAY INSPECTION.

During the past year one officer of the service was specially detailed to make daily inspections of the docks and that part of the bay inside the breakwater. This daily inspection has been required for two main reasons: First, to ascertain that all vessels lying alongside the piers are complying with the regulations regarding rat guards; and, secondly, to maintain the piers in as clean and sanitary condition as possible. Inspection in the bay has been maintained to prevent the dumping overboard of garbage and other waste food products which may be washed ashore and serve as food to the rats in the breakwater.

A special letter was also sent to customs and health officials requesting that every effort be made to reduce the rat population which infested the riprap of the breakwater surrounding the piers. A special communication was also sent to the director of the bureau of public works advising that this riprap be filled in to a point below low-water line to prevent rats from finding a hiding place.

Manila is practically the only city in the Orient at which plague does not appear in epidemic or endemic form at some season of the year. Up to the year 1914 plague had been prevalent in Manila for many years, and it is not unreasonable to expect that, unless every precaution is taken, the disease will again gain entrance into the islands.

EXAMINATION FOR LICENSES.

Regular examinations for license as masters, pilots, and engineers are made by officers of the service upon application from the board of marine examiners. A special examination was also given to such masters, pilots, and engineers who had held papers for many years and who had not had a physical examination during this period of time. Upon special request not only was the visual and color perception test made but also a complete physical examination was given each man.

Physical examinations were made of the officers of the Coast and Geodetic Survey and applicants for entrance in the Philippine Naval School.

AID TO OTHER SERVICES.

Even with a small personnel the bureau of quarantine service has continued to be a considerable aid to the departments and bureaus of both the Federal and Philippine Governments, and has also furnished information to foreign consuls regarding shipments of certain classes of cargoes to their countries, and given information regarding the health conditions at the various ports.

Briefly stated, aid furnished to other departments of the Government was as follows: (1) Bureau of customs—physical examination of seamen, examination of aliens, medical service to aliens when necessary, dispensary and first-aid treatment to the bureau of customs' employees in time of urgent necessity. (2) Food and drug board—as in past years, this service has continued the examination of meats and meat products and the certification of signature of the inspecting officers from foreign countries. (3) Bureau of education—physical examination of applicants for the nautical school of the bureau of education. (4) Bureau of agriculture—disinfection of vessels of the bureau of agriculture which carried diseased animals. (5) Weather bureau—typhoon signals displayed as warning to shipping. (6) Lighthouse establishment—a lighthouse was attended for the lighthouse establishment. (7) Bureau of health—vessels used by the bureau of health in transporting lepers to Culion were disinfected and fumigated. Besides the foregoing, services of a minor nature were rendered to other bureaus and departments.

MAINTENANCE AND NEW CONSTRUCTION AT CEBU.

During the past year the service was fortunate enough to be able to provide the many necessary repairs and improvements which for a number of years were needed at the Cebu quarantine station. Com-

plete repairs to the officers' quarters and the first-class cabin barracks were made by replacing the old foundation with new concrete underpinning and rebuilding such parts of these buildings as had become deteriorated from weather conditions and dry rot. A new concrete sea wall was constructed extending along practically the whole south side of the island. This was a very necessary improvement, as it has been ascertained that during the past 10 years at least 50 yards of the south shore was washed away. The isolation buildings were in danger of being completely submerged and washed away during the various severe storms that occurred in the typhoon season. The old disinfecting building was demolished and the apparatus was installed in a new concrete building. With the increase of appropriation secured for maintenance and repairs for the quarantine service, the service, with the aid of the bureau of public works, has begun repairs to the attendants' quarters, bath, pier, pharmacy, and other buildings, and it is expected that the entire station will be in an excellent state of repair in a few months. An appropriation of ₱25,000 was also secured for the erection of a new first-class cabin barracks, and its construction has already been initiated. This building will contain ample room for the housing of approximately 30 to 40 first-class passengers.

MAINTENANCE AND CONSTRUCTION OF MARIVELES QUARANTINE STATION.

A new concrete building was erected to replace the wooden one which has been used as attendants' quarters, and a new fender system was put in to replace the old one, which had been destroyed during the past typhoon season.

That part of the quarantine station which in previous years had been a swamp connecting with the river that passes behind the station has been completely filled in with a rock foundation, so that the entire station is now above high-water line even during the severe part of the rainy season.

The appropriation of ₱60,000 which was asked for for the construction of a new first-cabin barracks was not obtained, but it was found that it would be possible to completely repair the present wooden structure and make it available for the next five years. This work has also been begun and will be completed during the next several months. Substantial repair work has also been made to the pipe line of the water system and toward the replacement of the present wooden buildings which shelter the baths and waiting rooms adjacent to the pier.

Although no floating equipment has been purchased by the service during the year, it was possible, on account of the increase in the appropriation for the maintenance of the vessels of the service, to have complete repairs and overhauling of the launches at the ports of Manila and at Cebu, so as to continue them in service for several years longer.

CAVITE AND OLONGAPO.

The quarantine stations established at Cavite and Olongapo are operated for the convenience of the vessels of the United States Navy. The quarantine duties at these two ports are carried out by

regular medical officers of the Navy, who make the inspections, issue bills of health, and perform the other quarantine functions as officers of this service. Navy vessels are permitted to arrive and receive pratique at either of these two ports without calling first at one of the established ports of entry in the Philippine Islands. No equipment belonging to the bureau of quarantine service has been furnished for these two stations, the officers using the equipment of the Navy to carry out their duties as quarantine officers. When infected vessels arrive at either port they are remanded to Mariveles for such treatment as is indicated. During this year no vessels arrived with quarantinable disease on board. The usual fumigation by the pot method and inspection of vessels in port and disinfection of such vessels as carried tuberculosis, leprosy, and similar communicable diseases were carried out in usual manner both at Cavite, Olongapo, or Manila. No vessels were required to suffer quarantine detention at either port.

CEBU.

At Cebu the service maintains a quarantine station located on the island of Cagit, which serves for the treatment of infected vessels and their personnel which may arrive at ports in the southern portion of the Philippine Archipelago.

The quarantinable disease which most frequently occupied the attention of the quarantine officer at Cebu this year was cholera. Three vessels having cholera or cholera carriers on board arrived at Cebu and each was given appropriate treatment both of vessels and personnel. Two cases of cholera were cared for at quarantine and 26 cholera carriers were detected among the persons quarantined.

All of the usual quarantine functions were carried out without any complaint on the part of the public. There were fumigated 108 vessels and medical inspections of 118 applicants for marine licenses were made.

The quarantine station at Cebu, as stated elsewhere in this report, received considerable repair work during the year, and the station is now in very excellent condition with the exception of the pier and the artesian well, the water of which is still salt.

ILOILO.

At the port of Iloilo the service maintains at the present time a quarantine inspection station. Efforts to obtain funds for the construction of a building to house the disinfecting plants have been futile. The service has a lot of ground near Fort San Pedro on the river upon which it is hoped that a building can be erected to house the disinfecting plants which are already on hand; and also perhaps to serve as a place where cases of quarantinable diseases removed from vessels can be housed for a time. Since the location is very central and contiguous to the city the plan is to make same also available for provincial and municipal disinfection work, such facilities being very greatly needed in the city of Iloilo.

The amount of shipping arriving at Iloilo is not great, but from a quarantine standpoint Iloilo is an important port on account of the fact that vessels which do arrive seem to come from centers which are almost constantly badly infected with quarantinable diseases

Both cholera and smallpox were brought to the port. Five vessels were detained in quarantine on account of having quarantinable diseases occur on board. The vessels engaged in interisland shipping having headquarters at Iloilo were fumigated every six months to reduce to a minimum the rat population on board such vessels. In this work there were fumigated 245 vessels during the year.

MANILA.

In the port of Manila vessels are inspected upon arrival at the regular anchorage for vessels in Manila Harbor, during good weather outside of the breakwater and during bad weather in the basin formed by the breakwater or at buoys of the particular vessel which may arrive.

No notable changes were made in the method or manner of conducting the quarantine work at Manila during the past year. The hours of inspection were continued from sunrise to sunset. Recommendations were made for a longer period of inspection hours for freight vessels arriving from noninfected American ports, but no change was made in the usual routine.

The general comments on the quarantine work in the islands applies also to the port of Manila.

Statistics of that part of the work at the port of Manila in connection with vessels leaving for United States ports, generally known as consular quarantine, may be tabulated as follows:

Bills of health issued	274
Crew inspected	24, 057
Passengers inspected, cabin	7, 202
Passengers inspected, steerage	17, 242
Crew and passengers vaccinated	2, 126
Pieces of cargo certified	4, 111, 674
Vessels disinfected and fumigated	7
Vessels inspected	204

MARIVELES QUARANTINE STATION.

The quarantine station at Mariveles which serves as the disinfection and detention station for the northern section of the Philippine Archipelago was maintained in a high state of efficiency during the year. The amount of detention and actual stay in quarantine of vessels has been generally reduced, and this is reflected in the work accomplished at the Mariveles quarantine station during the year. The usual disinfection of the vessels which transported lepers to the leper colony and the fumigation of interisland vessels calling at the station for that purpose was carried out.

The capacity of the station was tested when the *Sheridan* arrived with typhus fever and smallpox on board among the 2,210 persons. The vessel and personnel received adequate treatment. The cases of typhus fever and smallpox were left at the station and the vessel proceeded, after the usual observation, to Trieste. No secondary cases occurred on board.

It was possible to accomplish considerable repair work during the year and the station at the close of the year is in better condition than for some years. At the close of the fiscal year the bureau of public works commenced to thoroughly repair the cabin passenger barracks; and a new fender system for the wharf has just been completed.

A few of the transactions at the station may be seen tabulated in the following table:

Vessels calling at the station for treatment.....	6
Vessels disinfected or fumigated.....	6
Persons bathed and effects disinfected.....	677
Pieces of baggage disinfected.....	4, 600
Persons vaccinated	2, 410

ZAMBOANGA AND JOLO.

Inspection stations are maintained at Zamboanga and Jolo with an acting assistant surgeon in charge, who is compensated according to the number of vessels direct from foreign ports inspected. No equipment belonging to the Quarantine Service is on hand. Considerable importance attaches to the quarantine work at both Jolo and Zamboanga owing to the proximity to Borneo and other infected ports where quarantinable diseases are under very little control and where we do not have American consular officers to supervise the shipment of cargo or to advise of the prevailing diseases.

PUERTO MEXICO, MEXICO.

Acting Asst. Surg. B. H. Frayser was on duty through May and June and will continue during the remainder of "active" quarantine season. His duties include the issuance of American bills of health to vessels bound for United States ports, the fumigation of vessels as required, the inspection of crews and passengers bound for United States or its possessions, and the reporting of sanitary conditions. Puerto Mexico has commercial relations with Vera Cruz, Guatemala, the western coast and northern Mexican cities. A large number of oil boats from Tampico enter Puerto Mexico en route to Minatitlan, but there is very little shipping from United States at present due to internal conditions caused by the revolution, but it is expected that improvements will take place later on. Six vessels were inspected, four of which were fumigated for the destruction of mosquitoes. No case of yellow fever was reported during the fiscal year, though the infection appeared shortly thereafter. In making diagnoses "port physicians" do not always exercise care, and many cases are reported as "intestinal fever" or "dysentery." The records of deaths include a number as being due to "malaria" and "dysentery." A few *Aedes Calopus* have been noted, but it is stated that during the rainy season mosquitoes abound in the city. The Mexican Government has a building located on one of the docks which contains the office and residence of "port physician," an excellent steam sterilizer, and shower baths. The "port physician" is not a graduate in medicine and the measures carried out by him are inefficiently executed, but it is expected that a change will occur at an early date.

SHANGHAI, CHINA.

Acting Asst. Surg. S. A. Ransom reports as follows:

Inspection of vessels destined for ports of the United States has been performed throughout the year in the same manner as formerly, although with the advent of new agencies and an expanding commerce there has been more and more difficulty in securing definite

data as to the sailing time of ships, and this has caused more or less confusion in regard to the inspection and treatment of vessels.

To prevent the spread of plague, vessels have been required to load in streams where practicable and when alongside of wharves they were required to be fended off 6 feet with connecting lines rigged and with gangway raised at night when not in use. Wharf inspectors have been employed to supervise and enforce these regulations. A periodic fumigation is required of all lighters engaged in the loading of vessels. There were inspected during the year 346 vessels, of which number 37 were fumigated or disinfected. Whenever possible sulphur dioxide has been used for fumigation of ships, but carbon dioxide has been employed when the nature of the cargo was such as would be injured by the use of sulphur.

While there has been an increase of communicable diseases in Shanghai during the year, there has been present no quarantinable diseases in epidemic form, although sporadic cases of cholera, small-pox, and cerebrospinal fever have been reported in the settlement. Rabies among the dogs has been particularly noticeable.

THE VIRGIN ISLANDS.

Passed Asst. Surg. Liston Paine, chief quarantine officer, St. Thomas, reports as follows:

The transfer of the quarantine function from local administration to the Federal Government was finally accomplished by an Executive order dated September 27, 1917. By virtue of that Executive order the United States quarantine laws and regulations were put into effect on November 1, 1917, superseding the Danish regulations. The Danish quarantine officer at St. Thomas retired, but the boarding fees continue to be collected in accordance with paragraph 23 of the ordinance of October 23, 1885, which was continued in force by the act of Congress March 3, 1917. In accordance with the above ordinance these fees are collected by the collector of customs, and by authority of the governor are turned into the colonial treasury.

The small quarantine station formerly maintained at St. Thomas by the Danish Government was occupied as a battery station during the war by the United States Marine Corps. It has been given up by them, now that it is no longer needed, and it is hoped that before long it can be enlarged and developed, to be used again as a quarantine station.

The two-story building on Main Street, the upper floor of which is used as a quarantine office, the downstairs for the out-patient dispensary and laboratory, has been painted inside and outside, and a new galvanized iron roof put on.

Authority for establishing a second-class relief station was received September 21, 1918. Patients requiring hospital relief, including war-risk insurance patients, are sent to the local contract hospital (municipal hospital).

The chief quarantine officer is stationed at St. Thomas (Charlotte-Amalie). The inspection of vessels and the issuing of bills of health at the two subports, Frederiksted and Christiansted, St. Croix, are performed by the naval medical officers on duty there under the supervision of the service officer at St. Thomas. Medical inspection

of alien passengers and seamen is made at all three ports, but hospital relief is furnished only at St. Thomas.

Fumigation of vessels.—During the coming fiscal year this station will be well equipped to fumigate any vessel, large or small, requiring such treatment. A warehouse on the water front has been rented for storage of materials and either cyanide or sulphur will be used, as the conditions permit.

Typhoid fever.—There has been no case of typhoid fever in which the infection occurred in the Virgin Islands during the fiscal year. This no doubt is due to the systematic inoculation of the inhabitants of the three islands with triple antityphoid vaccine, the greater part of the vaccine being furnished by the Hygienic Laboratory of the Public Health Service; an intensive campaign directed toward the eradication of flies; better cooperation from the public in preventing soil pollution; closer supervision over the production and distribution of milk by the local health department.

Yellow fever.—There has been no yellow fever in the Virgin Islands, but the presence of the *Aedes Calopus* mosquito in considerable numbers would constitute a serious menace if a case of yellow fever should enter this port, especially since there are so many non-immune persons residing on the islands and but few houses are screened.

Leprosy.—Leprosy is endemic in the Virgin Islands. All cases are sent to the hospital in Richmond, near Christiansted, St. Croix, for isolation. The number confined at present is 35 males and 34 females.

IMMIGRATION.

The great importance of having a Federal immigration office established in the Virgin Islands to prevent the landing of persons capable of infecting the local populace is continually being emphasized by the result of physical examinations of alien passengers passing through St. Thomas en route to the States; several of these were found to be harboring uncinaria, schistosoma, or filaria.

OTHER OPERATIONS.

Other operations at this port include marine hospital and outpatient relief to seamen and war-risk insurance patients; medical inspection of seamen; medical inspection of aliens; physical examinations of the personnel of the United States Coast and Geodetic Survey, of the Lighthouse Service, and treatment of injured United States civil employees.

QUARANTINE TRANSACTIONS.

During the fiscal year ending June 30, 1920, at St. Thomas there were inspected and passed 273 vessels and 1 vessel fumigated. These ships had a personnel of 6,360 passengers and 8,949 crew. At Christiansted there were inspected and passed 4 ships with a personnel of 2 passengers and 33 crew, and at Frederiksted, 32 ships were inspected and passed with 2,075 passengers and 1,439 crew.

St. Thomas has been for many years an important shipping center; many vessels call at this port, both coming from and going to

European ports, Scandinavian countries, South America, from the Pacific coast through the Panama Canal, from the continental United States, and from Mexican ports—the latter vessels bring fuel oil.

Since the erection of the two 50,000-barrel capacity fuel-oil tanks by the United States Shipping Board on Hassel Island, it is not an infrequent thing to see at one time from 12 to 16 large vessels in the harbor of St. Thomas waiting to discharge cargo or to take on fuel oil.

MEDICAL INSPECTION OF ALIENS.

During the fiscal year ended June 30, 1920, there were examined by medical officers of the Public Health Service 762,127 immigrants for the purpose of detecting diseases and physical or mental defects, in accordance with provisions of the United States immigration laws. This number of immigrants, as compared with 339,375 of the preceding year, shows an increase of 422,752. In addition to the immigrants examined, there were also inspected all alien seamen on incoming vessels, as provided in the act of February 5, 1917.

The total number of aliens certified was 25,109. Of this number, there were certified 734 for tuberculosis or mental conditions, 5,216 as being afflicted with either loathsome contagious or dangerous contagious diseases (chiefly trachoma, gonorrhea, and syphilis), 14,810 as having conditions that affected their ability to earn a living, and 4,349 for minor defects. The number certified to was an increase of 4,689 over that of the preceding year.

As in the previous year, there were a number of conditions obtaining that seriously impaired the efficiency of the medical examination, and this particularly applied at the larger ports. The transportation facilities for enabling medical examiners and inspectors to board incoming vessels is wholly inadequate. At the port of New York there is only one boarding vessel, and when it is out of commission on account of necessary repairs expedients have to be resorted to, as boarding the vessels at the docks or utilization of the customs cutters. To compensate for lack of transportation, the service necessarily has to assign additional medical officers, with resulting waste of administrative effort. Additional boarding facilities at New York and other larger ports would, undoubtedly, be in the interest of economy. The medical examination of alien crews for immigration purposes has to be performed under conditions that are not conducive to efficiency. The examination is necessarily a hurried procedure and attended with a lack of equipment for a thorough physical examination, with no privacy, and the result is far from perfect. Inasmuch as this class of aliens (seamen) is actively engaged in an occupation that necessitates certain physical standards, it is apparent that there would be but few who could be certified for physical defects impairing their ability to earn a living, and it is also natural to expect comparatively few would be suffering from mental defects. When the latter occurs, the master of the vessel will naturally make a report to the medical officers of such conditions. This combination of circumstances more or less compensates for the imperfect examination performed on board vessels.

The detection of venereal disease in crews constitutes the chief difficulty, as it is manifestly impracticable to carry out laboratory

examination of each person, and main reliance must be placed on clinical examination for making tentative diagnosis. In addition to this technical difficulty is added the possibility of evasion by those diseased. While this may not be very successful in acute cases, detection can be prevented in a certain number of instances by those persons suffering from a disease in the convalescent stage. The medical examiners on the Atlantic seaboard report during the past year an improvement in the venereal incidence among seamen. It is stated that greater care is being exercised by the steamship companies, particularly the larger ones, who have an organized medical department. The chief medical officer at Ellis Island, N. Y., expresses as his opinion that there has been a very considerable betterment in the venereal rate amongst the crews of the large trans-Atlantic vessels.

It is to be hoped that some legislation will be secured, providing a penalty against steamship companies in cases where diseased alien seamen are discovered. Such a penalty would act as a deterrent against the employment of diseased persons in the same way as the penalty clause now provided in law acts to minimize the importation of diseased immigrants. At the present time there is no penalty clause with respect to diseased alien seamen, and, as a result, the hospital capacity at various ports has been greatly taxed, and in some instances has proved wholly inadequate to provide accommodations for this class of seamen. In common with insufficient housing accommodation, there is a marked lack of hospital space throughout the country. The necessity for hospitalizing a large number of aliens increases the hospital difficulties at seaports. It is most important that some legislation be enacted providing a penalty clause which would probably bring about medical examination at the foreign port of departure and thus prevent the employment of diseased alien sailors on board vessels destined for ports of the United States.

The conditions attending the enforcement of immigration laws on the Mexican border render more or less ineffective medical examinations, since it is not difficult, at ports along the border, for aliens to enter illegally, if the incentive is sufficiently great. From El Paso to the west, the dividing line between the United States and Mexico is artificial and imaginary. To the eastward of El Paso, the upper reaches of the Rio Grande River, more especially in the dry season, can easily be forded in places, and from its source to its mouth the Rio Grande River in no place presents a formidable barrier. An alien rejected at any of the ports of entry, if sufficiently desirous of entering the United States can, with but little inconvenience, proceed above or below the port of entry and there gain crossing. It seems evident from reports received that thousands of illegal, clandestine entries occur along the Mexican border and these can not be prevented until there be established a border control, extending from the Gulf to the Pacific. There are certain stretches of border that would require, of course, but a small force on account of the remoteness from centers of population and difficulties of travel, and this especially applies to the desert regions and those localities where the physical character of the territory is more or less of a barrier to entry.

	Aliens certified. ¹										Important diseases for which certification was made. ¹									
	Class A.		Class B: Disease or defect which affects ability to earn living.	Class C: Disease or defects of less degree.	Total.	Tuber- choma.	Tuber- culosis.	In- sanity.	Idiocy.	Imbe- cility.	Epi- lepsy.	Feeble- minded and psycho- pathic inferi- ority.	Favus.	Syph- ilis.	Soft chan- cre.	Gonor- rhea.				
	(1) Idiocy, imbe- cility, feeble- minded, in- sanity, epi- lepsy, and tuber- culosis.	(2) Loath- some con- tagious or dang- erous con- tagious.																		
Number of aliens exam- ined. ¹	6	485	602	1,063	2	6	4	1				1		66	171	234				
Baltimore, Md.	29,631																			
Biscayne Bay (Fla.) quarantine.	6,747	7	3	27	9		3					1	3	2		2				
Blaine, Wash.	172	12	85	830	387	1,314	25	3	3		1	1	3	8	20	32				
Boston, Mass.	49,444	4	192	300	54	550	187			1	1		2			2				
Brownsville, Tex.	4,518	1																		
Brunswick, Ga.	57																			
Buffalo, N. Y.	10,745	40	4	317	50	420	1	5	10	2	1	4	9	1		2				
Calais, Me.	215	3		13	3	19		1					2							
Calcutta, Calif.	1,399	2	13	4	3	22	2		1				1			11				
Charleston, S. C.	4,183	5		1	1	7										5				
Del Rio, Tex.	3,268			12	0	21														
Detroit, Mich.	3,944	27	22	70	211	330	1	1	1	1		1	2	1		1				
Douglas, Ariz.	2,870	3	17	2		22	17	2					1							
Duluth, Minn.	8,128	1		31	43	75														
Eagle Pass, Tex.	17,256	12	9	24	79	124	2	6		2			3	4		2				
Eastport, Idaho.	2,810	8	1	119	3	131		5			1		2	1		2				
El Paso, Tex.	39,188	19	48	448	284	790	6	5	3	2		4	3	15		11				
Galveston, Tex.	14,280	4	221	517	315	1,057	6	4						8	80	92				
Halifax, Nova Scotia.	6,419	6	3	101	34	144							3			1				
Hidalgo, Tex.	2,825																			
Honolulu, Hawaii.	3,624	3	39	95	14	151	38	2	1							1				
Houlton, Me.	537	5				6														
International Falls, Minn.	40	6		63	3	72		2	1		1		3		1					
Jacksonville, Fla.	1,689		12			12														

¹ Includes alien seamen.

Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada—Continued.

Number of aliens examined.	Aliens certified. ¹				Important diseases for which certification was made. ¹										
	Class A.		Class B: Disease or defect which affects ability to earn living.	Class C: Disease or defects of less degree.	Total.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded and psychopathic inferiority.	Syphilis.	Soft chancre.	Gonorrhea.	
	(1) Idiocy, imbecility, feeble-minded, insanity, dangerous leprosy, and tuberculosis.	(2) Loathsome or contagious.													
Ketchikan, Alaska.....	1,326	1			1						1				1
Key West, Fla.....	45,436														
Laredo, Tex.....	35,711	11			11										
Lewiston, N. Y.....	1,047	1	48	18	68					1		1			
Los Angeles, Calif. (San Pedro).....	6,805	3	5		8	3						2	1		3
Marcus, Wash.....	829	3	1	35	34				1	1	1				1
Mobile (Ala.) quarantine.....	6,271														
Montreal, Canada.....	19,068	83	42	678	567	39	6	2	2	6	24	3	8	26	
Naco, Ariz.....	3,204	3	11	3		9	1				1				
New Orleans (La.) quarantine.....	47,424	2	339	179	520					2				90	211
New Orleans (city).....	7,058	3	61	9	21	3						16	18	16	
Newport News, Va.....	16,446	3	100		306	10						5	52	40	
Newport, Vt.....	4,298	28		158	69		4	5	2		3				
New York, N. Y.....	694,795	118	882	6,339	870	84	39	37	6	15	21	16	232	390	
Niagara Falls, N. Y.....	3,134	11	6	90	51	2	3	3	4	1		3	2	2	
Nogales, Ariz.....	24,348	13	198	20	4	188	4				3		6	6	
Norfolk, Va.....	77,711	8	872	16		94	7	8	896		1		199	476	
Ogdensburg, N. Y.....	646	7	1	24	21	5				1	1	1		1	1
Oroville, Wash.....	71			9											
Pascagoula, Miss.....	190														
Pensacola, Fla.....	1,792	1	29	14	17						1		11	14	4
Philadelphia, Pa.....	49,700	10	525	130	47	8	3	2			5	2	90	219	
Philippine Islands.....	9,879											186			
Port, N. Dak.....	401														
Port Arthur, Tex.....	4,998	13	3	23	15	54	2	4	2	2	1			1	
		7	205	196	50	458	5	2	2	2	4	52	31	86	

Port Huron, Mich.....	2,009	43	1	187	55	286	1	8	4	7	6	3	20	18
Port Townsend, Wash.....	10,804	7	52	6	2	67	11	6	1	2	1	9	9	19
Portland (Me.) quarantine.....	11,653	2	40	1	2	43	4	1	1	2	1	3	3	5
Portland, Oreg.....	19	2	.....	.....	2	4	.....	.....	.....	.....	.....	.....	.....	6
Porto Rico (other than San Juan)	5,976	3	21	74	38	136	4	1	.....	1	4	3	3	5
Providence, R. I.....	10,521	10	2	89	37	138	1	3	.....	4	4	1	1	6
Quebec, Canada.....	6,671	4	7	4	.....	15	1	1	.....	1	2	1	1	6
Rio Grande City, Tex.....	548	7	.....	25	33	65	.....	1	2	2	1	1	1	6
St. Albans, Vt.....	484	4	3	127	53	187	.....	3	.....	1	1	2	2	4
St. John, New Brunswick.....	1,386	4	3	24	21	66	.....	.....	.....	.....	.....	.....	.....	1
St. Thomas, V. I.....	4,155	1	21	24	21	66	.....	.....	.....	.....	.....	2	12	4
San Diego, Calif.....	6,929	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	4
San Francisco, Calif.....	71,429	10	189	161	175	535	60	5	3	2	2	2	22	29
San Juan, P. R.....	34,710	4	2	26	38	70	1	1	1	1	1	1	1	1
Sault Ste. Marie, Mich.....	1,619	11	1	18	161	189	.....	2	2	.....	1	.....	.....	36
Savannah, Ga.....	3,861	.....	122	23	28	173	.....	.....	.....	.....	.....	12	72	8
Seattle, Wash.....	11,318	1	49	733	4	787	30	6	.....	.....	.....	3	3	8
Sweetgrass, Mont.....	1,340	6	2	67	147	222	2	1	.....	1	.....	.....	.....	5
Sumas, Wash.....	31,690	3	1	8	.....	12	.....	1	1	.....	.....	2	7	1
Tacoma, Wash.....	1,707	.....	15	.....	.....	15	2	.....	.....	.....	.....	.....	.....	1
Tia Juana, Calif.....	1,060	1	1	3	2	7	.....	1	.....	.....	.....	1	1	16
Tucson, Ariz.....	1,223	14	81	4	.....	99	41	5	3	4	4	23	.....	1
Van Buren, Me.....	83	2	1	4	4	11	.....	1	.....	.....	.....	.....	.....	1
Vancouver, British Columbia.....	3,437	21	26	244	98	389	16	10	.....	.....	.....	.....	.....	.....
Victoria, British Columbia.....	5,973	3	1	32	54	90	.....	.....	.....	.....	.....	.....	.....	.....
Winnipeg, Canada.....	9,808	75	21	1,370	45	1,511	14	37	2	.....	.....	1	.....	1
Yarmouth, Nova Scotia.....	28,660	4	1	28	51	84	.....	.....	3	.....	.....	.....	.....	1
Total.....	1,537,527	734	5,216	14,810	4,349	25,109	1,028	256	112	24	28	62	35	2,047

1 Includes alien seamen.

Alien seamen inspected and certified.¹

	Inspected.	Certified.	Important diseases for which certification was made.										
			Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded.	Favus.	Syphilis.	Soft chancre.	Gonorrhea.
Baltimore, Md.....	29,096	1,089	6	4	1	.....	.....	.....	1	.....	66	171	234
Boston, Mass.....	32,297	435	19	1	.....	.....	.....	1	.....	.....	5	19	30
Galveston, Tex.....	14,126	1,052	6	4	.....	.....	.....	.....	.....	.....	8	80	91
New Orleans, La.....	42,562	409	31	.....	.....	.....	.....	1	.....	.....	.....	90	211
Newport News and Norfolk (quarantine).....	88,714	1,002	94	8	3	.....	.....	1	.....	.....	94	251	516
New York.....	361,068	660	13	11	2	.....	.....	.....	.....	.....	92	190	321
Philadelphia, Pa.....	45,319	626	6	3	2	.....	.....	.....	1	.....	181	84	216
San Francisco, Calif.....	46,671	51	.....	.....	.....	.....	.....	.....	.....	.....	2	20	19
Total.....	849,853	5,384	175	31	8	.....	.....	3	2	.....	448	905	1,638

¹ Statistics are given only for the larger seaport stations.

REPORTS FROM IMMIGRATION STATIONS.

BALTIMORE, MD.

Acting Asst. Surg. W. H. Hoak reports as follows:

One thousand two hundred and fourteen vessels subject to immigration inspection arrived at this port during the year, with a total of 535 alien passengers, who were subjected to medical examination. Twenty-nine thousand and ninety-six alien seamen were also examined. In addition to this number, 150 stowaways were examined.

There were 1,093 medical certificates issued during the year for diseases or physical defects.

Aliens employed on American vessels and certified as suffering from loathsome contagious diseases were required to be treated at the out-patient dispensary, as follows: Gonorrhea, 87; syphilis, 13; chancroid, 27.

Aliens employed on American vessels and certified as suffering from dangerous or loathsome contagious diseases were required to be treated in hospital, as follows: Gonorrhea, 26; syphilis, 17; chancroid, 33.

Alien seamen employed on foreign vessels and certified as suffering from dangerous or loathsome contagious diseases were recommended hospital treatment, as follows: Gonorrhea, 41; chancroid, 16; syphilis, 12; dementia precox, 1; tinea barbæ, 5; peritonitis, tubercular, 1; feeble-minded, 1; trachoma, 6; tuberculosis, 3; filariasis, 2; psychosis barbæ, 1.

With the approval of the Commissioner of Immigration, owing to the short time in port, detention and treatment on board their respective vessels were advised in case of alien seamen employed on foreign vessels and certified as suffering from loathsome contagious diseases, as follows: Gonorrhea, 80; chancroid, 95; syphilis, 24.

A secondary examination of practically all aliens recommended for hospital treatment for dangerous loathsome contagious diseases after their discharge from hospitals was necessary in order to determine whether they had entirely recovered.

BOSTON, MASS.

Acting Asst. Surg. A. J. Nute, in charge, reports as follows:

For the fiscal year ending June 30, 1920, 935 vessels arrived at the port of Boston from foreign ports, of which 691 were inspected under the immigration laws. Seventeen thousand one hundred and forty-seven alien passengers and 32,297 seamen were inspected during the fiscal year.

Medical certificates were issued against 879 passengers and 445 seamen.

During the year 5.1 per cent of passengers and 1.38 per cent of seamen were certified.

Number of vessels, passengers, and seamen for 1919 and 1920.

	Vessels.	Passengers.	Seamen.
1919.....	623	685	27,605
1920.....	691	17,147	32,297

Information from reliable sources indicates that the numbers would have been greater had there been available vessels to handle the traffic and war restrictions removed. The larger part of the passenger traffic came from Italy and the Portuguese possessions, the lesser from Great Britain, India, South Africa, and Central America. A small number arrived from Egypt and South America.

Boston received a severe blow to its passenger traffic during the war, owing to the number of vessels lost at sea. Although conditions are improving, they will not become normal until steamship companies are able to replace the lost boats. It is understood that most of the lines have boats under construction for this purpose.

The general physical condition of arriving aliens was above expectations, considering reports of conditions in their home lands.

The scope of work during the past year may be divided into the following classes:

1. Boarding of vessels for primary inspection of passengers and crews; also inspection of aliens applying at the station to legalize their entry into the United States.

2. Physical and mental examination of aliens detained on primary inspection.

3. Surveillance over aliens placed in hospitals for diagnosis or treatment.

4. Medical advice relating to aliens detained in the immigration station.

5. Sanitary advice relating to the protection of detained aliens and the prevention of disease in the detention station.

6. Investigation of alien public-charge cases to supply the Department of Labor with medical information desired.

7. Medical and sanitary advice relating to the care and protection of detained aliens at Deer Island Prison, Boston Harbor.

8. Medical boards.

9. Office work.

Arriving passenger ships are either boarded at the dock or from the Coast Guard tug in the harbor. The boarding medical officer examines the report of the ship's surgeon and arranges for the proper disposal of any cases requiring treatment or further observation. The first cabin passengers are inspected in the saloon and the second and third classes on the dock. Upon completion of the passenger inspection the officers and crew are inspected on the ship. In the case of a ship carrying a small number of mixed passengers, all are inspected on board.

The inspection of second-class passengers on the dock has been more satisfactory than the old method of inspecting under conditions existing on shipboard. The present system insures better protection to the passengers from injury in opening hatches and handling baggage, less exposure to climatic influences, better working facilities, more control over passengers' movements, and the inspection can be conducted more rapidly.

The crew inspection is a problem in itself. On the large ships it requires considerable ingenuity to get any satisfactory results. During the past year the general procedure has been to take a statement from the master or medical officer in regard to any physical, mental, or venereal diseases among the crew. The officers were inspected in a similar manner to first-class passengers and the crew along lines applied to steerage passengers. At discretion of the boarding medical officer, conditions permitting, alien members of the crew were examined for any demonstrable evidence of venereal infection. When privacy could be assured the crews have cooperated very well. This system is not perfect and might be improved if more facilities were available.

Lack of advance information regarding steamship arrivals, even in this day of wireless communication, requires a medical officer to be in constant touch with the station from sunrise to sunset.

Owing to emergencies, medical officers have inspected arriving vessels at the subports of Plymouth and New Bedford, Mass., and New London, Conn.

Secondary examinations of the more serious defects have been made at the station or in the hospitals. Only such cases as presented unquestionable evidence were certified at time of primary inspection.

Eight hospitals were utilized within the city limits. In hospitalizing aliens the type of disease and available space had to be considered. At times this was difficult owing to the local demand for hospital space, but the hospitals have shown a friendly attitude in their relations with the service. Hospital visits were made as often as possible. Owing to location of station and location of the hospitals, it requires about half a day to make the rounds of any one institution, but considering the variety of cases the present system is the most satisfactory and economical. These visits have resulted in a friendly understanding being established between the respective staffs and the service, efficient verification of diagnosis, supervision of treatment, and protection of expenses to transportation companies and immigration fund. Information obtained from these visits was recorded on a card system available to all concerned. During the year 341 aliens were admitted to hospitals, and of these 3 died, 2 from pneumonia and 1 from valvular disease of the heart.

Daily, between 10 and 11 a. m., a visit was made by a medical officer to the detention rooms and cases suspected of illness were investigated. In the station noncontagious skin diseases, minor defects, and injuries were treated. Detained infants frequently required artificial feeding. Two of the most common affections were throat infections and autointoxication. The latter was more prevalent among the males, who had no inclination to do anything but eat and rest.

Sanitary conditions prevailed similar to previous reports until April 12, 1920, when the Immigration Service moved into its new building, 287 Marginal Street, Jeffries Point, East Boston. This building is of fireproof construction, one story high, and supposed to accommodate 582 aliens. The male dormitory has 35,300 cubic feet, with 272 folding bunks, affording when filled 134 cubic feet of air space per person. The female dormitory has 40,000 cubic feet, with 310 folding bunks, providing 130 cubic feet of air space per bunk.

Each quota of detained immigrants brings a certain amount of vermin, and some provision should be made for delousing. The prevention of bronchial and other contact diseases might be reduced by avoiding overcrowding and by efficient handling of mess gear, towels, drinking cups, and blankets. Attention has been called to these matters in the past, and probably, as money becomes available, they will be improved. There have been no epidemics, with the exception of the usual outbreaks during the winter of acute infections of the upper respiratory tract, which were promptly controlled. Sporadic cases of diphtheria, measles, and meningitis have occurred, but were detected early and suppressed.

At the request of the Immigration Service, investigations were made of certain alien public-charge cases in institutions in order to provide the Department of Labor with evidence upon which to act. Investigations and reports were filed in regard to progress of diseased aliens landed for treatment at hospitals in different parts of the district.

On March 17, 1920, the service assumed medical and sanitary supervision of aliens detained at Deer Island Prison. A medical officer was appointed and, owing to the location of the island, assigned for resident duty under instructions and guidance from this office. Arrangements were made for the care of 900, but the largest number detained was 420. On June 12, the remaining aliens having been transferred to the local immigration station, the services of the medical officer was discontinued.

Under authority of bureau letter of March 7, 1916, medical boards were convened at the request of the commissioner for the reexamination of aliens, not only certified at Boston, but throughout New England. This duty alone required considerable time and often extreme care in submitting conclusions. Attorneys grasped the opportunity to appeal many cases for board examinations whether said cases were arriving aliens at any port of entry in New England or pending deportation under warrants based on certificates from State institutions, apparently with the hope of getting a certificate of recovery or disagreement with the original certificate on record.

The Public Health Service has been allotted a suite of four rooms in the northwest corner of the detention station for office and ex-

amination purposes. To date they are poorly furnished, and as three of these rooms were not originally intended for their present use, it will be necessary to have substantial changes made in order that the work may be properly carried out.

The general office work consists as in the past of furnishing certificates of aliens arriving by sea, and of aliens applying to legalize a previous entry, also certificates relating to aliens' ability to travel without danger to life and the need of any special care. Records of hospital admissions, index cards of condition, diagnosis, result of treatment and discharge were filed for reference. Proposals for medical supplies furnished by the Immigration Bureau; correspondence relating to medical aspect of immigration work; reports concerning information desired by the commissioner relating to "prior cause" evidence offered by institutions and organizations on public charge cases; medical board reports for Bureau of Immigration reviewing cases from New England ports of entry; public institutions and warrant cases were also filed. The commissioner occasionally refers to this office for comment and suggestions various problems relating to immigration administration and welfare of detained aliens.

Acknowledgment should be made of the pleasant relations existing between State and local officials with the service, and the faithful co-operation of the local office staff during the past year.

GLOUCESTER CITY, N. J.

Surg. D. E. Robinson, in charge, reports as follows:

Immigration at the port of Philadelphia showed a considerable increase over the preceding year, due to the return to normal conditions following the war, and especially to the increased amount of American shipping.

Alien passengers to the number of 4,381 were inspected during the year, and 86 were certified for diseases and physical defects.

The greater part of the work was in the examination of the crews of vessels, there having been inspected 1,109 vessels, with crews totaling 45,319. The large amount of this work made necessary the appointment of two additional medical officers in order to cover all incoming vessels, as, in the absence of a boarding steamer, the ships had to be boarded at the docks along a river front of 62 miles.

Six hundred and twenty-six certificates were rendered for diseases and defects found among alien members of crews. Those found to be afflicted with venereal diseases were hospitalized and permission to be paid off withheld until discharged from the hospital as cured.

Although the number of aliens entering the country through the port of Philadelphia showed an increase over the preceding year, immigration did not keep pace with emigration, 7,881 aliens having departed from this port as against 4,381 entering here.

HALIFAX, NOVA SCOTIA.

Acting Asst. Surg. T. W. Flinn reports as follows:

There were 6,419 aliens examined, and certificates rendered for 144 aliens who were found to be affected with either mental or phys-

ical defect, an increase in the number of aliens inspected and a slight decrease of certifications over the previous year.

The groups were divided as follows: Border class, 5,460; seaport class, 959; aliens of the border class certified, 104; aliens of the seaport class certified, 40.

The number of passenger ships that arrived within the above period was 99, carrying 30,994 passengers, who were landed at this port; of this number, 1,486 were destined to the United States and 29,508 for Canada; United States citizens, 527; aliens, 959. The aliens aboard ship were classified as follows: First cabin, 517; second cabin, 198; steerage, 244.

The diseases and defects either of a mental or physical character justifying the issuance of medical certificates were classified as follows: Class A (1), 6; class A (2), 7; class B, 55; class C, 76. Of the total number certified, 33 were excluded by United States immigration authorities. The ratio of medical certificates issued to the total number of aliens examined was $44\frac{8}{144}$, as compared with $37\frac{3}{149}$ for the previous year.

The decreased percentage of certificates issued over the previous year, as compared with the larger number of aliens inspected, was probably owing to the superior mental and physical make-up of aliens of the border and seaport classes, as the aliens of the latter class landing here were mostly British and Scandinavians.

No action on the part of the service was necessary when 45,692 Chinese coolies from France landed at this port in transit through the State of Maine by the Canadian Pacific Railway en route via British Columbia to Hongkong, China.

The difficulty of securing bookings on the other side, and likewise passport restrictions, which have been operative throughout the past year, have combined in reducing travel destined to the United States via Canadian seaports to a very low figure. As soon as those restrictions are removed there is no doubt of a heavy influx of United States destined passengers via Canada.

Owing to the prevalence of smallpox in parts of the maritime provinces, especially the Province of Nova Scotia, during the winter and spring months of 1919, and the fact that the disease was traceable to its occurring among members of the crews of fishing vessels clearing from this port and arriving at Boston and New York, the service representative received on July 8, 1919, instructions from the bureau as to the proper measures to be taken as to quarantine and vaccination. After consultation with the United States consul general here, as advised in the letter of instructions, the order was carried out as far as it was practicable. The result of carrying out the quarantine and vaccination order had somewhat of a deterrent effect on the traveling public, causing transportation companies to be very anxious and much concerned as to the prospective loss of business, until the situation was relieved by the removal of the ban by the Surgeon General on August 28, 1919.

The abnormal conditions affecting immigration at this port for the past six years have at last disappeared.

The service is now occupying quarters in the Immigration Building on pier 2, the whole structure being of reinforced concrete, erected by the Canadian Government for immigration purposes and finished early in 1914; but the European war intervening, the building and

pier were transferred to the British military and naval authorities, who occupied the premises until this spring.

The service was unfortunate in being disturbed in its occupancy of quarters, moving twice since March 1 of this year, but appears to be permanently established in its new quarters, probably for some time to come.

MONTREAL, CANADA.

Surg. M. K. Gwyn in charge.

During the fiscal year ending June 30, 1920, 19,068 aliens were examined, of whom 1,397 aliens were certified for various mental and physical defects.

The more important certifications were as follows: Class A-1, 83, of whom 82 were refused admission to the United States and 1 was permitted to enter. Class A-2, 42, all of whom were refused admission to the United States.

In addition to the above, 52 Chinese citizens of the United States were examined and 2,226 alien Chinese in transit to the West Indies and South America.

The inspection work is steadily increasing, as will be seen from the following table:

Aliens inspected during the year ending—

June 30, 1918	8, 184
June 30, 1919	10, 330
June 30, 1920	19, 068

The last amount does not include 2,278 Chinese in transit through the States.

In consequence of the large increase in the number of aliens coming up for examination, it would be advantageous to have sufficient office space for two examiners, to work simultaneously, and to have a trained nurse to assist in the examination of women, the latter being, under present conditions, somewhat perfunctory. The risk of frivolous charges being made by unscrupulous women is also worthy of consideration, and a nurse would be a protection.

An additional medical inspector is needed, so that the medical inspection may be made more expeditiously. The additional cost would be more than covered by the saving to the public of the care and support of the mentally deficient, who would be weeded out by a more careful examination. The examination of the insane and defective frequently requires more than an hour, and meanwhile the examination of other aliens is held in abeyance.

The summer period makes more apparent the urgent need of a rest room for the women and children applying for permits to cross the border. The only place they can get a drink of water is from a common drinking cup in the doctor's office. In fact, the only place mothers can attend their babies is in the same office, or else in the public hall or waiting rooms, which are crowded all day long.

There is an utter lack of privacy in making inspections, not only for the medical officer, but for the inspectors also, and aliens requiring inspection are subjected to long, irritating delays.

The toilet facilities supplied the public, and also the immigration inspectors, are located in the cellar of the building and are very unsatisfactory.

There is great need of remedying these conditions, if it is at all possible to do so, as they not only make very difficult the enforcement of the immigration act, but are causing discontent among the people the office is intended to serve.

NEW ORLEANS, LA.

Acting Asst. Surg. J. T. Scott reports as follows:

There were boarded and inspected at the port of New Orleans, La., 157 vessels, carrying 1,263 immigrant and nonimmigrant aliens, of whom 18 were certified for various physical and mental diseases and defects. Six of these cases were deported, 12 being landed.

There were 5,795 alien seamen examined. Of these, 74 were certified for various physical and mental diseases and defects and ordered returned to vessel when cured or able to resume their occupations as seamen. In addition, cases in detention at the immigration station were given necessary treatment. These certified alien seamen sent to the immigration station or marine hospital included class A-1, 3 cases; A-2, 57 cases; class B, 2 cases; class C, 12 cases. Other detained aliens included class A-2, 2 cases; class B, 8 cases; class C, 9 cases. In addition to the above, many cases were sent from the quarantine station, marine hospital, and other sources, making a total of 384 cases treated at the immigration station.

There has been considerable falling off of cases certified at this port and in detention at the immigration station. The examination of seamen at quarantine and at New Orleans proper has brought about an improvement in the personnel among the crews. Realization that if diseased they will be promptly removed from the vessel has caused sailors to be more careful in their habits, and, hence, fewer diseased seamen are found aboard ships.

There has been little or no immigration proper, most of the aliens arriving on passenger ships being of the nonimmigrant class, consisting principally of tourists and transients and the usual large number of foreign merchants from Central America and South America.

In addition to those certified at New Orleans proper, quite a few cases are sent from the marine hospital because of the crowded condition there. These cases not being beneficiaries, and some of them in-subordinate as well, are sent for further treatment to the immigration station. These latter cases cause more or less trouble, and have to be threatened with a period in the parish prison in order to make them submit to treatment. Quite a few cases are ordered to the immigration station from quarantine for the purpose of further observation, to determine definitely the nature of the disease from which they are supposed to be suffering.

The immigration station is only partially equipped for hospital service. Attention has repeatedly been called to the necessity of a trained nurse and a moderately adequate supply of drugs, etc., all without results. There are two matrons, one a fairly good nurse, the other absolutely unfitted for her position as matron-nurse, and neither is a graduate nurse.

Quite a few Chinese in transit are sent to the immigration station, many of whom have trachoma and requiring daily attention when detained, with only an unskilled matron to carry out orders of the

medical officer. All cases of syphilis are given a thorough arsphenamine treatment before being discharged, and gonorrhea cases remain under treatment until free from infection. A few minor operations were performed, the graver ones being sent to the marine hospital for treatment or elsewhere, this being necessary on account of lack of equipment and competent assistance. Various public institutions have to be visited from time to time to examine detained aliens.

Several trips have had to be made to the station at nighttime on account of severe reaction following the administration of arsphenamine and for other reasons. The Government may be criticized should some detained alien die during the night without receiving prompt treatment, as no medical officer resides at the station and there is no trained nurse to carry out directions pending the arrival of a doctor. A trained nurse should be on duty at the station at night, in order that she might keep watch over cases requiring close observation. The matron does not remain at the station at night unless there are women detained.

NEW YORK, N. Y.

With the termination of actual hostilities December 18, 1918, and the gradual release of ships from military service during the succeeding six months a new epoch in immigration may be regarded as having begun. During the two years preceding June 30, 1920, the numbers of arriving aliens had declined to the lowest in a generation.

While there was a slight increase of passengers during the fiscal year 1919 as compared with 1918, the numbers being 55,191 for 1918 and 62,253 for 1919, no marked increase was observable until after the beginning of the fiscal year 1920. During this last-mentioned year the passengers and crews arriving at New York from foreign ports were as follows:

Aliens in cabin	120, 986
Aliens in steerage	212, 741
Total aliens	333, 727
Citizens (cabin)	67, 877
Citizens (steerage)	17, 643
Total citizens	85, 520
Grand total, aliens and citizens	419, 247
Crew, aliens	361, 068
Grand total, aliens, citizens and crew	780, 315

SURVEILLANCE OF MEMBERS OF CREWS.

The examinations of members of crews were made aboard ship on arrival with occasional examinations of individuals in the barge office. The numbers increased somewhat during the year. These may be expected to vary within narrow limits from year to year.

As previously reported, venereal diseases formed the bulk of all cases of seamen held under the immigration law. The practical result was their treatment until cured of these affections.

In consequence of the detention of those suffering from venereal diseases, it is understood some of the largest steamship companies

have instituted regular systems of inspection to exclude such cases from among their crews.

In accordance with department policy the expenses of care and treatment of alien seamen apprehended under the immigration laws have been referred to the Commissioner of Immigration for reimbursement, regardless of whether such seamen were from foreign or American ships.

EXAMINATION OF PASSENGERS.

The number of arriving passengers was over five times the number examined in either of the two preceding years; in fact, the annual immigration during these years is believed to be less than for 50 years, if not for a century. Until March 16, 1920, all examinations of passengers and crews were made aboard ship. On the date mentioned the medical inspection of steerage passengers was resumed at Ellis Island. With present facilities it is practicable to carefully examine the steerage passengers arriving, each one being seen by two medical officers.

The necessity of thorough work is fully recognized and the medical inspections are being developed accordingly. In order to do so, a number of officers eminent in the specialties have been assigned to devote part time to cases in their specialties. In addition, staff conferences have been devoted regularly to the medical problem arising.

As compared with social and economic questions related to immigration, there are medical and public-health problems which require special consideration at this time. Thus it is a reasonable requirement that vermin-infected persons should not be dumped on our shores, particularly in view of the widespread prevalence of typhus fever in Europe. Furthermore, those generally infected with scabies should be required to undergo treatment before landing, otherwise there is danger of the spread of this infection.

Especially is it important to inquire carefully as to the freedom from tuberculosis, insanity, and mental defects. For this purpose it is necessary to hold for thorough secondary examinations large numbers from certain sections.

In general the physical types arriving have been equal to those of previous years, but it is believed they represent selections from among hosts who desire to come. Judged by physical conditions and habiliments they give little evidence of adverse environment abroad.

EXAMINATIONS AND TREATMENT OF WARRANT CASES.

Under the immigration laws aliens previously landed are constantly being gathered up on warrants and brought to Ellis Island from different parts of the United States. All of them must be examined to determine whether they may be safely detained in the main building or whether, by reason of some physical or mental disability, they should be kept in hospital.

During the past year the number of this class examined has been considerable. Many of them have had to be sent to hospital on account of insanity or have found their way there later on account of developing some infectious disease, especially respiratory, while in detention.

It has been the practice for years for medical officers to visit the detention rooms at least three times daily to minister to those who may be sick. By this means also the spread of contagious disease is guarded against.

AN OUTBREAK OF INFLUENZA.

Notwithstanding these precautions, an outbreak of influenza developed and rapidly spread in the detention rooms during December, 1919. While outbreaks of coryza and tonsilitis had been noted from time to time among those detained, no specially severe cases were recorded until the last week of December, when the number of admissions to hospital suddenly increased. Many of the cases were complicated by pneumonia and many additional cases were diagnosed pneumonia from the outset.

The total number of cases of influenza admitted to hospital during this outbreak were one each day during October and November, 15 during December, 52 during January, 10 during February, 11 during March, and 2 during April. The total number of cases of pneumonia during like periods were 7 during December, 48 during January, 16 during February, 23 during March, and 13 during April. Not only were aliens in detention affected but officers and employees as well. The outbreak preceded in point of time the recrudescence of the epidemic throughout the country. There was no evidence that the infection came from abroad. In fact, the bulk of the cases were among so-called radicals who had just previously been collected together from many parts of the country. By doing so conditions analogous to those prevailing in the military camps during 1917 were approximated when large numbers of young nonimmunes were assembled in crowded quarters. An outbreak of respiratory diseases was the inevitable result, the infection having in all probability been brought to the station by the apprehended aliens.

DEVELOPMENT OF HOSPITAL FACILITIES.

On July 1, 1919, the hospitals were returned by the Army to the Immigration Service, and their administration was resumed by the chief medical officer for the latter service.

In consequence of arrangements made between the Bureau of Immigration and the United States Public Health Service, the hospitals were turned over to the last-mentioned service September 1, 1919, to be operated as United States Public Health Service Hospital No. 43. It was the understanding that alien patients would at all times be given precedence so far as admissions were concerned, and that the remaining facilities of the hospital would be available for beneficiaries of the United States Public Health Service, including American seamen and persons discharged from the military and naval services.

NUMBER OF PATIENTS TREATED.

The total number of patients admitted to hospital were as follows:

Public Health Service beneficiaries	758
Aliens	5,297
Aliens in hospital July 1, 1919	23
Grand total treated	5,978

In addition to those admitted to hospital, 67 service beneficiaries were treated as out-patients. It is the practice also to render out-patient treatment in emergencies to officers and employees of the Government. The number of these treated during the year totaled 245.

As previously stated, it is the practice for medical officers to make three daily rounds through the detention rooms. In consequence many aliens are given out-patient treatment. The number so treated during the year was 3,376.

LABORATORY ACTIVITIES.

With the great increase in the number of patients in hospital the laboratory work of the station has become very heavy. As will be seen by the tabulated report, there were examined 10,550 specimens.

Laboratory specimens examined during fiscal year ending June 30, 1920.

Urethral smear for gonococcus infection.....	3,747
Vaginal smear for gonococcus infection.....	43
Urines for gonococcus infection.....	14
Urines.....	1,025
Urines for bacillus typhosis.....	10
Feces for animal parasites.....	76
Feces for bacillus typhosis.....	9
Feces for blood.....	2
Widals (para A and para B typhosis).....	29
Scalp for favus and ringworm.....	289
Sputum for tubercle bacilli.....	307
Blood for malaria.....	105
Blood count and differential.....	218
Blood cultures.....	39
Wassermann tests.....	2,857
Tissue for leprosy.....	6
Throat culture for diphtheria.....	1,332
Throat smear for Vincent's angina.....	23
Smear penis Vincent's spirillum and fusiform bacillus.....	5
Cultures fluid aspirated chest.....	44
Dark field for treponema persenuae.....	4
Dark field for treponema pallidum.....	214
Direct smear for treponema pertenue.....	3
Smear from eye (morax axenfeld).....	8
Smear from eye (gonococcus).....	7
Smear from abscess.....	8
Spinal fluid for meningococcus.....	13
Spinal fluid cell count.....	10
Spinal fluid globulin.....	10
Spinal fluid tubercle bacillus.....	2
Spinal fluid Wassermann.....	10
Spinal fluid colloidal gold.....	1
Sputum type pneumococcus.....	31
Vomitus for blood.....	3
Ear cultures.....	46
Total.....	10,550

By reason of the diverse nature of the diseases encountered, coming as they do from all parts of the world, there is abundant opportunity for studies of exotic infections, especially from the Tropics. There is particular need of intensive studies of mycotic infections, as they form an important group from immigration and public-health stand-points.

The laboratory should have departments of bacteriology, pathology, and physiological chemistry fully developed.

X-RAY STUDIES.

As full use as possible has been made of the X-ray apparatus on hand. A summary of the work is embodied in the following table:

Number of exposures	1, 577
Fluoroscopies	33
X-ray films	1, 260
Dental films	419
Plates	88

Anatomical classification of cases examined.

Accessory sinuses	33
Bones and joints	101
Pulmonary	526
Cardiovascular	5
Gastrointestinal	20
Head	56
Pelvis	18
Spine	29
Teeth	43
Urinary tract	16

While the X-ray apparatus is complete, the current which is manufactured locally is not entirely suitable for its operation. In consequence considerable periods elapsed when parts of the machine were out of commission.

RECONSTRUCTIVE WORK.

As a means of maintaining morale and hastening recoveries among patients two occupational therapy nurses were attached to the hospital. In addition a representative of the American Library Association was assigned regularly to distribute literature, and the social workers arranged for by the bureau through the Red Cross were on duty daily during the year. As an example of the scope and utility of this work it is interesting to note that 9,209 books were distributed in the hospital in 26 different languages during the year and periodicals in four additional languages. These agencies have been helpful in every way possible and their aid is hereby acknowledged.

The tabulated statements of work accomplished are presented below in tabular form:

Report of medical certificates relating to alien passengers.

Class A (1), including 35 insane, 18 feeble-minded, 6 idiocy, 3 constitutional psychopathic inferiority, 15 imbecility, and 28 certified for tuberculosis	105
Class A (2), loathsome contagious diseases, including 71 trachoma, 34 syphilis, 42 chancroid, 69 gonorrhea, 1 leprosy, 16 favus, 16 trichophytosis unguium, 2 trichophytosis tonsurans, and 15 trichophytosis barbae	266
Class B, disease or defect which affects ability to earn a living	6, 309
Class C, diseases or defects of less degree	869

Report of medical certificates relating to alien seamen.

Class A (1), including 2 insane and 11 certified for tuberculosis	13
Class A (2), loathsome contagious diseases, including 13 trachoma, 92 syphilis, 190 chancroid, and 321 gonorrhea	616
Class B, diseases or defects which affect ability to earn a living	30
Class C, diseases or defects of less degree	1

Disposition of immigrants certified.

Class A (1) :

Cases pending at beginning of year.....	9
Cases certified during year.....	105
Total to be accounted for.....	114
Cases deported.....	62
Cases landed.....	40
Cases pending close of year.....	12

Class A (2) :

Cases pending at beginning of year.....	7
Cases certified during year.....	266
Total to be accounted for.....	273
Cases deported.....	152
Cases landed.....	78
Cases pending close of year.....	43

Class B :

Cases pending beginning of year.....	13
Cases certified during year.....	6,309
Total to be accounted for.....	6,322
Cases deported.....	121
Cases landed.....	6,062
Cases pending close of year.....	139

Class C :

Cases pending at beginning of year.....	0
Cases certified during year.....	869
Total to be accounted for.....	869
Cases deported.....	1
Cases landed.....	857
Cases pending close of year.....	11

Race of aliens certified for mental condition during fiscal year ending June 30, 1920.

Race.	Insane.	Feeble-minded.	Imbecile.	Idiot.	Constitutional psychopathic inferiority.	Total.
Austrian.....	1					1
Cuban.....			1			1
Danish.....	1					1
Dutch.....				1		1
English.....	8	3	3		2	16
East Indian.....	1					1
France.....	1	2				3
German.....	1					1
Greek.....	2					2
Hebrew.....	1	1	1			3
Holland.....	1	1				1
Irish.....	1					1
Italy, North.....			1			1
Italy, South.....	9	10	3	2	1	25
Japan.....			1			1
Norway.....	1	1	1			3
Russia.....	2					2
Scotland.....	2		1			3
Serbian.....			2			2
Spanish.....	2			2		4
Swedish.....	1			1		2
Swiss.....	1					1
United States born.....			1			1
Total.....	35	18	15	6	3	77

Nativity and race of immigrants certified for trachoma during fiscal year ending June 30, 1920.

Nativity.	Greek.	Hebrew.	Irish.	Italy, South.	Japanese.	Javanese.	Maltese.	Mongolian.	Serbian.	Spanish.	Syrian.	Total.
China.....								3				3
Greece.....	3											3
Ireland.....			1									1
Italy.....				23								23
Japan.....					1							1
Java.....						1						1
Malta.....							2					2
Roumania.....		1										1
Russia.....		1										1
Serbia.....									1			1
Spain.....		1								24		25
Turkey.....		1									8	9
Total.....	3	4	1	23	1	1	2	3	1	24	8	71

Races of immigrants reported on medical certificates during fiscal year ending June 30, 1920.

Race.	Men.	Women.	Children.		Total.
			Male.	Female.	
African, black.....	12	3			15
Armenian.....	2				2
Austrian.....	1				1
China.....	3				3
Croatian.....	1				1
Cuban.....	1				1
Dutch.....		1	1		2
English.....	26	4		1	31
Flemish.....	6	2			8
French.....	11	1			12
German.....	1				1
Greek.....	25	1			26
Hebrew.....	10		1		11
Irish.....	3	1			4
Italy, North.....	3				3
Italy, South.....	62	20	5	4	91
Japanese.....	1				1
Javanese.....	1				1
Lithuanian.....	1				1
Maltese.....	5	1			6
Norway.....	4	1			5
Polish.....	2	1			3
Portuguese.....	6				6
Russian.....	1				1
Scotch.....	5	1			6
Serbian.....			1	1	2
Slovak.....	1	1			2
Spain.....	62	3		1	66
Sweden.....	5	2	1		8
Swiss.....	2	1			3
Syrian.....	10				10
Undetermined.....	3				3
Total.....	276	44	9	7	336

Causes of deaths in aliens.

Anemia, pernicious.....	1
Carcinoma (stomach).....	1
Chancroid of penis (septicemia).....	1
Diabetes mellitus.....	1
Diphtheria.....	3

Enteritis, acute	1
Influenza	6
Insanity	2
Measles	23
Meningitis, cerebrospinal	1
Nephritis, chronic	1
Otitis, media, chronic	1
Paratyphoid fever	1
Pleurisy, with effusion	1
Pneumonia, broncho	16
Pneumonia, lobar	45
Prematurity	3
Scarlet fever	3
Septicemia	1
Tuberculosis, chronic, pulmonary	13
Typhoid fever	1
Whooping cough	1
Burns, face, scalp, and arms	1
Total	128

Beneficiaries.

Carcinoma, stomach	1
Carcinoma, jaw	1
Hodgkin's disease	1
Tuberculosis, chronic, pulmonary	1
Tuberculosis, appendix	1
Total	5

Summary of hospital transactions.

Number of patients in hospital at the beginning of year	23
Number of patients admitted to hospital during year ¹	5,297
Total treated (men, 3,009; women, 1,026; male children, 680; female children, 605)	5,320
Births (male, 2; female, 4)	6
Deaths (men, 38; women, 31; male children, 32; female children, 27)	128
Pay patients treated during year	4,619
Free patients treated during year	678
Number of days treatment pay patients	65,626
Number of days treatment free patients	12,537
Total number of days treatment for hospital cases	78,163
Maximum number of patients in hospital at any time during year	416
Daily average number of patients in hospital	214
Number of patients in hospital at end of year	355

Hospital.	From previous year.	Admitted.	Total treated.	Recovered.	Improved.	Not improved.	Died.	Remaining.	Days treatment.
Aliens	23	5,297	5,320	2,923	1,260	654	128	355	78,163
Beneficiaries	0	758	758	213	379	56	5	105	25,009

NOGALES, ARIZ.

Acting Asst. Surg. A. L. Gustetter reports as follows:

During the past year, on account of a ruling by the Secretary of Labor that exempted Mexican laborers from the head tax, contract labor, and illiteracy features of the immigration act, a large number

¹ 758 beneficiaries not included in this statement.

have been permitted to temporarily enter the United States at this port for work in the cotton fields of Arizona and in the beet industry of California. With reference to the aliens who entered the United States under the ruling of the Secretary of Labor, it is desired to state that all such aliens were required to pass a satisfactory physical and mental examination before being admitted, and in every other respect were required to comply with the immigration laws and regulations. This has brought in a great influx of the laboring class. During the period from September 1, 1919, to March 1, 1920, there were 6,312 aliens of this class examined and admitted. Of this number, 5,000 were vaccinated. No epidemic disease was reported in either the State of Sonora or Sinaloa, Mexico. There were 24,348 aliens inspected during the past fiscal year, of which number 235 were certified for various physical defects.

NORFOLK, VA.

Acting Asst. Surg. F. C. Makepeace, in charge, reports as follows: During the fiscal year ending June 30, 1920, 77,711 persons were examined and 923 certificates issued.

Commencing September 30, 1919, the medical inspection of arriving alien seamen was changed from Cape Charles quarantine to Norfolk and there conducted by a service officer, who accompanied the immigration inspector in boarding vessels. This is believed to be a more satisfactory arrangement than performing the inspection at Cape Charles Quarantine Station. The result has been a very considerable elimination of unnecessary delay to commercial interests.

The most serious difficulty in carrying on the work is the lack of adequate hospital facilities to receive alien seamen certified. The hospital space available on frequent occasions has been insufficient to meet the requirements, thus creating an embarrassing situation. Beds for only 70 patients were available at the close of the fiscal year, while at least double that space is necessary.

PENSACOLA, FLA.

Acting Asst. Surg. S. R. Mallory Kennedy, in charge, reports as follows:

There were 1,792 alien seamen examined at this station during the fiscal year ending June 30, 1920, of whom 61 were certified, showing an increase in the number examined of 1,017. The number certified under the four classes was as follows: Class A-1, 2; class A-2, 29; class B, 20; class C, 10.

This is not a true index of the absolute number of different aliens examined. All aliens, the crew included, on an arriving vessel must be examined each time the vessel enters this port. Certain ships are regularly engaged in trade between Pensacola and Habana, and some make two and three trips a month.

A large percentage of the same crew remains on board during the fiscal year, and one alien may be examined fifteen or twenty times each year. It will be seen at a glance that this also applies to the number and class of defects. For example, one alien may have a right inguinal hernia, and this same defect may be repeatedly certified to as long as this alien remains in this trade.

As required by law, all aliens should have been examined for venereal disease. On several occasions aliens refused to submit to the examinations. The immigration officer was notified, and he in turn notified the captain not to allow the alien ashore. This is rather difficult for the master, especially when his vessel is berthed at a dock; and while theoretically it serves, in practice it is more than probable that these men go ashore and possibly spread their infections to others.

PORT HURON, MICH.

Acting Asst. Surg. George M. Kesi reports as follows:

Owing to an unusual prevalence of smallpox throughout the Province of Ontario, a modified quarantine was placed in effect at this port at 7 a. m. on November 26, 1919, by direction of the Surgeon General, remaining in effect until midnight March 19, 1920.

Travelers entering the United States from Canada at this port entered via ferryboat and via the Grand Trunk Railway. For this reason it was necessary to maintain personnel at the dock of the Port Huron & Sarnia Ferry Co., and also at the Grand Trunk Tunnel Depot. The personnel at the ferry dock consisted of two graduate nurses and two lay inspectors; the personnel at the depot consisted of two nurses and one lay inspector. Additional assistance was rendered when necessary at both points by the deputy collectors of customs and inspectors of immigration. During the quarantine period 8,621 persons were vaccinated, an average of approximately 75 per day. The work was conducted at both points with an idea of causing as little delay to passengers as possible. With the exception of one train, the work of inspection and vaccination of passengers was done in offices. This exception was a night train arriving about midnight. The day-coach passengers on this train were brought into the office for inspection and vaccination, but the Pullman passengers who were in their berths were inspected and vaccinated by a nurse with deputy collector of customs acting as assistant.

Quite a few fraudulent certificates of vaccination were discovered, and constant vigilance was necessary on the part of the nurses to detect the same. With the exception of a few persons who refused vaccination and returned to Canada, passengers were willing to comply with the modified quarantine regulations.

During the year ending June 30, 1920, 1,962 alien passengers were inspected at this port, of whom 283 were certified as affected with mental or physical defects or disease. Eighty-one certified alien passengers were returned to Canada either partly or wholly on account of the medical certification.

There were 47 alien seamen examined upon request of the inspector in charge, United States Immigration Service, of whom 3 were certified as having mental or physical defect or disease. Every effort was made to conduct these physical examinations without delay to shipping.

The medical inspection of aliens requires an officer to hold himself in constant readiness to make inspections, in order to prevent delay to passengers entering the United States. This is particularly true at this port, where work of this character continues on Sundays and holidays without interruption.

QUEBEC, CANADA.

Passed Asst. Surg. J. M. Gillespie, in charge, reports as follows:

Subsequent to the immigration act of February 5, 1917, an agreement was made between the United States Commissioner General of Immigration and the Canadian transportation companies to have aliens destined for the United States inspected at the port of arrival in Canada and there passed or rejected, thus saving the transportation companies the expense of further transportation in the case of rejected aliens. The United States Government provides the officials for the examination and the transportation companies furnish the facilities for examination. Beginning May 1 and ending November 30, Quebec is the port of entry for steamships arriving in Canada. Inspections are made in the new concrete building erected by the Canadian Government, approximately 135 feet of which is arranged for the accommodation of the United States Government officials.

Aliens inspected here are of two general classes, "border cases," residents of Canada seeking admission to the United States, and those arriving by steamships from overseas in transit to the United States. Of the cases seeking admission to the United States from Canada, certificates were issued on account of various physical defects and diseased conditions, such as tuberculosis, spinal curvature, scabies, and pediculosis. The total number examined in this group was 538. Ships belonging to the Canadian Pacific Ocean service, the Anchor-Donaldson, the Canadian White Star, and the French lines are now arriving, and later the Cunard Line is expected. These ships bring passengers from Glasgow, London, Liverpool, Antwerp, and Havre. The class of aliens for the United States is considered better than the average, and are composed largely of Scotch, Irish, and English, but continental ships bring occasionally a few Belgians, Russians, Serbians, Poles, and Hebrews.

Since the opening of this office May 1, 1920, it has been noticed that the inspection of immigrants at the ports of embarkation has not been as thoroughly done, nor the medical attention on shipboard as careful as in prewar days. It therefore has been necessary to impose numerous fines on the transportation companies. The following is a summary of transactions:

Total number of ships arriving	93
Number of American citizens arriving	972
Number of alien cabin passengers	2, 878
Number of alien steerage passengers	3, 235
Total number of alien passengers arriving	6, 113
Number of aliens examined	6, 651

Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada.

Class A-1	11
Class A-2	2
Class B	89
Class C	37
Total certified	139

SAN FRANCISCO, CALIF.

Asst. Surg. W. T. Harrison reports as follows:

During the fiscal year a total of 24,758 alien passengers were inspected, which represents an increase of 72 per cent over the number inspected during the fiscal year 1918-19. Of this number, a total of 484 were certified in all classes, which represents a slight proportionate decrease over the preceding year. This is explained by a more careful examination of immigrants which obtains at ports of embarkation.

The 484 certificates have been distributed among classes as follows: Class A (I), 10, of which 7 were deported; class A (II), 148, of which 111 were deported; class B, 154, of which 6 were deported; class C, 172, of which 3 were deported.

A total of 46,671 alien seamen were inspected with the assistance of the medical officers assigned to the quarantine station, and 51 were certified, distributed in classes as follows: Class A (II), chancre, 20; gonorrhea, 18; chancre, 2; secondary syphilis, 1. Class B, blindness one eye, 1; bubo, nonspecific, 2; glaucoma, 1; post-operative wound, 1; ulcer of leg, 1. Class C, bubo, inguinal, 1; ichthyosis, 1; scabies, 2.

The total number of alien seamen inspected represents an increase of 60 per cent over the preceding year, while the proportion certified remains approximately the same.

Service officers, as in former years, continued to administer the hospital attached to the immigration station on Angel Island. During the year there were admitted for treatment 749 aliens, some of them suffering from acute ailments necessitating medical relief, and others afflicted with one of the loathsome or contagious diseases. Of this latter group were included three cases of clonorchiasis, 20 cases of scabies, 23 cases of trachoma, and a varying number of venereal cases. There were three deaths in the hospital—one from beriberi, one from cerebrospinal meningitis, and one from a mental condition with organic complications. During the year there were 111 cases of hookworm treated at the hospital, 110 of whom were cured and discharged from the hospital.

SEATTLE, WASH.

Acting Asst. Surg. F. J. Clancy reports as follows:

During the past year, the Japanese immigration has materially increased on account of the order denying passports to "proxy" or "picture" brides. As a consequence there was a large number of this class seeking admission before the order could be put in force. The hookworm certificates have increased proportionately, as apparently a great many have been given transportation before the completion of the uncinariasis treatment in Japan. The cases do not present the same clinical symptoms, being not as severe as formerly. The average length of treatment is about 11 days. During the past year all the steerage passengers and the second cabin passengers, landing for the first time, have been examined and the treatment of these cases is attended to by a local physician.

A rigid examination of the eyes of incoming aliens has been maintained, and it would seem as if the prevalence of trachoma were on the increase among the poorer classes.

Owing to the increased activity of the Department of Justice against members of the I. W. W. and similar organizations, a large number of this group have been continuously held at the detention house, requiring an increase in the medical work, as sick call is necessary each morning.

During the month of April, 1920, one Japanese alien developed epidemic spinal meningitis after being admitted to the detention quarters. The disease was, no doubt, contracted en route from Japan. The patient was removed to a local hospital, where the diagnosis was confirmed by lumbar puncture. The station was then placed under quarantine and nasopharyngeal cultures made of all aliens, the cooking and eating utensils sterilized after each meal by live steam, and the quarters fumigated by formaldehyde. No carriers were found.

During the influenza epidemic all those presenting symptoms were immediately transferred to the city hospital for further observation, as the crowded quarters offered favorable conditions for the spreading of the infection. There was one death. The present station is unsuitable for long confinement on account of the overcrowding. The rooms, too, are poorly ventilated; the aliens do their own washing and the laundry is hung in all available space, thus obstructing the air currents. There are no facilities for providing exercise and for this purpose an open compound should be established.

With the arriving of new passengers, overcrowding generally results and, to relieve the congestion, hookworm examinations are immediately performed by the laboratory attendant.

It has been necessary to set aside two small rooms at the detention quarters, one for the observation of patients, the other for the confinement of trachoma cases, since the local hospitals refuse to accept the latter.

SANITARY REPORTS AND STATISTICS.

The history of epidemics of influenza indicated that there might be a recurrence of the disease during the winter of 1919-20, and the Public Health Service carefully watched the reports for indications of an outbreak. During the week ended January 17, 1920, reports from Chicago, Ill., indicated a sharp rise in the number of cases reported, and on January 16 a telegram was sent to the city health officer of Chicago requesting full information. The reply indicated that an epidemic was beginning, and reports from Boise, Idaho, Washington, D. C., and a few other places showed an increase in the number of cases of influenza reported, which was sufficient to put health officers on their guard.

On January 22, 1920, telegrams were sent to all State health officers requesting daily telegrams giving the number of cases of influenza and deaths from influenza and pneumonia (all forms) reported in their respective States, and authorizing the State health officers to secure the necessary data from local health officers by telegraph at Government expense upon the outbreak of the disease in any locality and daily during the continuance of the epidemic.

This action was followed on January 31 by telegrams requesting State health officers to arrange for daily telegraphic reports from the principal cities direct to the Public Health Service, giving (1) the number of deaths from all causes, (2) the number of deaths from pneumonia, and (3) the number of deaths from influenza. These telegraphic reports were received from many of the States until the epidemic was definitely declining.

The reports were far from complete. Difficulties were encountered in securing reports from physicians, and many of the milder cases were not seen by physicians. Yet the cooperation of the State and local health officers enabled the Public Health Service to keep informed of the general progress of the disease and to furnish valuable information to health officers throughout the country.

Summaries of the reports received were published weekly in the Public Health Reports, with comparisons of the course of the disease with previous epidemics, especially that of 1918. During the month of February, 1920, a semiweekly telegram was sent to State health officers giving the latest figures reported to the Public Health Service.

A comparison of the figures for the influenza epidemic of 1920 with those for the epidemic of 1918 shows that the disease was less virulent in 1920, that the "peak" was reached sooner, and that the decline in the number of cases and deaths was more rapid. The 1920 epidemic ended in the spring, and it was not followed by the successive waves or "recrudescences" of the disease which followed the outbreak in 1918 and continued during the winter of 1918-19.

Reports from 46 large cities of the United States, having an aggregate population of more than 24,400,000, are given in the accompany-

ing table, which shows the number of deaths from influenza and pneumonia (all forms) reported in the 46 cities during the 12 weeks' period from December 28, 1919, to March 20, 1920. The figures were taken from the Weekly Health Index issued by the Bureau of the Census, supplemented by reports to the Public Health Service.

Deaths from influenza and pneumonia (all forms) in certain large cities, by weeks, in January, February, and March, 1920.

City.	Week ended—												Total.
	January.					February.				March.			
	3	10	17	24	31	7	14	21	28	6	13	20	
Albany, N. Y.	6	3	2	3	14	19	29	23	20	10	9	3	141
Atlanta, Ga.	7	19	11	10	15	32	75	104	75	46	26	22	442
Baltimore, Md.	30	20	35	24	59	122	268	231	123	80	65	34	1,091
Birmingham, Ala.	11	13	9	16	14	22	18	59	70	76	45	31	384
Boston, Mass.	24	28	28	45	85	158	255	216	136	80	48	37	1,140
Buffalo, N. Y.	13	10	7	19	17	67	141	145	98	56	38	24	635
Cambridge, Mass.	4	8	7	8	14	22	28	23	13	4	5	6	142
Chicago, Ill.	98	107	153	472	1,109	1,005	494	243	136	120	108	118	4,163
Cincinnati, Ohio.	18	14	12	17	25	38	62	81	99	73	34	37	510
Cleveland, Ohio.	28	21	25	26	41	158	258	177	125	71	57	52	1,039
Columbus, Ohio.	5	15	9	8	22	59	118	66	48	19	14	9	392
Dayton, Ohio.	7	4	7	13	46	47	32	24	7	5	6	9	207
Denver, Colo.	15	21	18	24	49	159	160	67	44	21	10	15	603
Detroit, Mich.	57	47	52	89	324	740	481	185	101	78	84	56	2,294
Fall River, Mass.	3	7	10	5	3	5	16	25	19	18	14	13	138
Grand Rapids, Mich.	3	1	4	2	6	31	37	32	14	11	5	3	149
Indianapolis, Ind.	13	18	16	21	36	92	124	72	49	41	20	23	515
Kansas City, Mo.	12	13	29	96	120	220	167	74	53	29	23	34	870
Los Angeles, Calif.	18	16	18	19	22	42	88	74	57	49	20	21	444
Louisville, Ky.	9	10	10	9	18	40	52	48	30	20	18	12	276
Lowell, Mass.	3	5	4	2	7	12	10	36	29	27	16	7	158
Memphis, Tenn.	15	12	12	11	10	22	64	61	46	42	24	17	336
Milwaukee, Wis.	15	25	14	45	141	184	121	41	31	16	14	19	666
Minneapolis, Minn.	20	12	10	9	63	168	125	53	13	8	18	7	506
Nashville, Tenn.	4	6	11	6	12	8	23	47	62	33	26	16	254
Newark, N. J.	15	17	14	30	55	116	142	93	54	34	24	32	626
New Haven, Conn.	11	6	8	10	19	20	60	68	31	23	17	15	288
New Orleans, La.	18	27	27	32	36	62	89	76	56	59	53	52	562
New York, N. Y.	195	218	261	511	1,308	1,988	1,796	987	513	369	317	284	8,747
Oakland, Calif.	7	4	8	20	24	55	54	60	21	17	19	6	295
Omaha, Nebr.	5	4	7	13	45	62	63	32	28	19	13	16	307
Philadelphia, Pa.	64	55	75	108	153	289	564	620	373	217	153	95	2,766
Pittsburgh, Pa.	55	47	53	55	76	168	417	290	193	105	77	52	1,588
Portland, Oreg.	4	13	8	9	17	21	57	52	41	28	13	15	278
Providence, R. I.	6	12	13	8	14	39	88	92	57	37	15	16	397
Richmond, Va.	6	2	9	6	21	35	38	28	13	8	7	6	179
Rochester, N. Y.	8	13	7	12	23	50	52	27	19	12	15	8	246
St. Louis, Mo.	47	57	41	73	236	401	282	129	60	35	33	33	1,427
St. Paul, Minn.	7	4	10	26	75	80	63	26	14	5	10	11	331
San Francisco, Calif.	20	14	26	48	59	115	137	113	89	54	32	23	730
Seattle, Wash.	9	12	4	7	12	32	98	78	59	34	15	8	358
Spokane, Wash.	0	4	3	3	12	32	64	33	17	10	7	9	185
Syracuse, N. Y.	6	9	8	10	31	89	78	29	23	11	6	13	313
Toledo, Ohio.	8	9	8	9	18	54	50	50	26	15	13	5	265
Washington, D. C.	32	22	27	81	181	164	92	55	30	23	20	22	749
Worcester, Mass.	5	10	9	7	14	15	44	52	34	59	18	12	279
Total	956	1,004	1,139	2,072	4,697	7,333	7,547	5,210	3,269	2,204	1,630	1,350	38,411

¹ Deaths from pneumonia (all forms) only.

² Deaths from influenza only.

In these 46 cities, containing nearly one-fourth of the population of the United States, the annual death rate from influenza and pneumonia (all forms) for the 12 weeks' period was 6.8 per 1,000 population, and the annual death rate during the week ended February 14 (when the greatest number of deaths occurred) was 16.1 per 1,000.

The rise and fall of the epidemic in these cities is shown by the annual death rate from influenza and pneumonia by weeks, as follows:

	Death rate.
Week ended Jan. 3, 1920.....	2.0
Week ended Jan. 10, 1920.....	2.1
Week ended Jan. 17, 1920.....	2.4
Week ended Jan. 24, 1920.....	4.4
Week ended Jan. 31, 1920.....	10.0
Week ended Feb. 7, 1920.....	15.7
Week ended Feb. 14, 1920.....	16.1
Week ended Feb. 21, 1920.....	11.1
Week ended Feb. 28, 1920.....	7.0
Week ended Mar. 6, 1920.....	4.7
Week ended Mar. 13, 1920.....	3.5
Week ended Mar. 20, 1920.....	2.9
Twelve weeks.....	6.8

Comparison of the excess¹ annual mortality rate per 100,000 from influenza and pneumonia (all forms) by weeks during the 1920 epidemic with that for corresponding weeks in the 1918 epidemic in cities included in the Weekly Health Index of the Bureau of the Census, considered as a whole.

Week ended—	Excess over rate for corresponding week of median year.	Week ended—	Excess over rate for corresponding week of median year.
1918.		1920.	
Sept. 14.....	—6	Jan. 3.....	—56
21.....	76	10.....	—55
28.....	326	17.....	—27
Oct. 5.....	1,028	24.....	184
12.....	2,557	31.....	1,741
19.....	4,592	Feb. 7.....	1,241
26.....	4,695	14.....	1,319
Nov. 2.....	3,332	21.....	867
9.....	1,832	28.....	422
16.....	989	Mar. 6.....	185
23.....	620	13.....	69
30.....	526	20.....	9
Dec. 7.....	617		
14.....	792		
21.....	801		
28.....	629		

¹ Excess over the mortality rate from the same causes in corresponding week of the median year in the period 1910-1916. The weekly rates for the median year have been approximated by plotting the rate for the median year for each month (thus affording a rough "normal" seasonal curve) for each city, and then by reading from the curve the indicated median rate at the midpoint for each week. The excess has been found by subtracting this median rate from the actual rate for the corresponding weeks in 1918 and 1920.

Cases of influenza reported by State health officers, December, 1919, to May, 1920, inclusive.

State.	Decem-ber, 1919.	1920.				
		January.	Febru-ary.	March.	April.	May.
Alabama.....	15	211	11,039	6,233	204	10
Arizona.....		160	800	439	31	171
Arkansas.....	137	3,526	22,718	6,533	575	101
California.....	111	9,522	46,857	7,944	457	175
Colorado.....		5,534	7,097	4		
Connecticut.....	26	7,732	15,055	880	62	6
Delaware.....	10	28	244	94		4
District of Columbia.....	23	2,980	1,004	43		
Florida.....	25	2,057	5,762	1,731	386	195
Idaho.....	13	4,147	2,890	312		2
Illinois.....	668	66,976	63,666	65,529	367	138
Indiana.....		5,175	18,217	3,080	279	
Iowa.....	9	4,848	71,993	134	11	
Kansas.....	67	9,037	48,285	6,666	163	11
Louisiana.....	75	968	12,117	6,419	83	12
Maine.....	10	517	11,474			15
Maryland.....	160	4,057	22,234	4,147	589	133
Massachusetts.....	147	5,076	28,340	2,215	227	98
Michigan.....			38,138	3,448		
Minnesota.....	36	7,275	24,607	2,575	130	57
Mississippi.....	1,628	3,673	26,270	17,482	1,985	520
Montana.....	6	1,603	5,191	401	4	2
Nebraska.....	5	2,988	16,845	2,758	258	6
New Jersey.....	124	8,570	16,208	1,055	89	24
New Mexico.....	12	335	3,771	395	59	21
New York.....	418	39,431	75,828	9,966	904	613
North Dakota.....	14	3,709	6,244	1,548	35	
Ohio.....	176	16,092	52,040	3,195	202	71
Oregon.....	7	1,345	5,965	598	4	
Rhode Island.....	8	1,170	5,799	242	9	
South Carolina.....	17		12,000	567	76	60
Vermont.....	5	118	3,584	1,281	43	
Washington.....		2,892	18,530	703	26	8
West Virginia.....	128	3,536	32,157	3,052	296	90
Wisconsin.....	13	11,263	24,731	1,523	36	18
Wyoming.....		2,526	1,330		10	6
Total cases reported.....	4,093	239,082	759,030	163,192	7,604	2,567
Number of States reporting.....	30	34	36	34	31	27

INDUSTRIAL MORBIDITY STATISTICS.

In accordance with plans which were inaugurated during 1916 and 1917 in the course of certain studies of health insurance, which were interrupted in large measure by other activities during the war, field work was started during the fiscal year on the collection and tabulation of reports of disease prevalence among wage earners in certain industrial establishments. This work is being carried on by the statistical office in cooperation with the Division of Sanitary Reports and Statistics and with the office of industrial hygiene of the Division of Scientific Research.

The principal purposes of this work are (1) to secure current reports of disease prevalence among wage earners in different plants, industries, and occupations, and (2) to collect data relating to the incidence of disease according to diagnosis among wage earners of different sexes, ages, rates, and occupations for the study of the influence of occupational and other conditions. The almost total absence of such records and data has long been recognized as a serious handicap to the scientific study of the health, and of conditions affecting the health, of wage-earning persons. It is believed that when a suffi-

ciently large number of industrial establishments and employees' sick benefit associations cooperate with the Public Health Service in furnishing regular reports of disease prevalence a better basis will be laid for the study of industrial hygiene and for more definitely directed preventive measures. In this connection it may be pointed out that among the not unimportant results of such a system of reports will be the encouragement given to the use of morbidity statistics for their own employees by the industrial establishments and their medical services.

A system of recording and reporting disease among wage earners was worked out along the general lines already laid down, but in greater detail, in cooperation with a special committee of the vital statistics section of the American Public Health Association. The detailed plan was presented in a report to the vital statistics section in October, 1918 (Public Health Reports, Aug. 30, 1918). In order to present it in a form for distribution among employers and employees' sick benefit associations, a pamphlet entitled "Sickness Records for Industrial Establishments" (Reprint No. 473, Public Health Reports, Nov. 14, 1919) was prepared in the statistical office. Since the recording and reporting of sickness among employees is closely related to the study of health conditions in plants, the value and use of the proposed system of records and reports in industrial hygiene was presented in another paper, entitled "Keeping tab on sickness in the plant." (Public Health Reports, Apr. 9, 1920.)

In securing the cooperation of establishments and employees' sick benefit associations letters were written to about 400 plants and organizations and personal visits were made to 66 plants. The present status of the cooperation of plants and associations is set forth in the following tabulation:

Sick benefit organizations reporting at present or agreeing to send current sickness reports to the United States Public Health Service.

Establishment and trade-union sick benefit organizations.	Number.	Number of employees to which the reports apply.
At present reporting monthly.....	39	75,000
Not yet reporting, but agreeing to report monthly.....	23	161,000
Not yet reporting, but agreeing to report quarterly.....	1	2,000
Not yet reporting, but agreeing to report semiannually.....	1	9,000
Total.....	64	247,000

Judging from the requests for personal interviews and assistance and from the general willingness of establishments to cooperate with the Public Health Service in this respect wherever some system of recording disease prevalence already exists, there seems to be a rather well-defined movement for keeping such records for the analysis of health conditions in plants. Several tabulations of the reports already made available are now under way, and it is expected that before the end of the present calendar year there will be a sufficient number of plants furnishing reports to warrant a current publication of the incidence rate for the more important causes of disability

among employees. Several plants have furnished this office with accumulated records; these are being tabulated and analyzed.

COLLABORATING AND ASSISTANT COLLABORATING EPIDEMIOLOGISTS.

In 1914, in furtherance of the means of cooperation between the Public Health Service and the State health authorities in procuring better reporting of diseases dangerous to the public health, the Public Health Service appointed collaborating epidemiologists for duty with a few of the State boards of health, where the State laws and regulations were of such character as to indicate that the action would be of mutual benefit to Federal and State health work. The first collaborating epidemiologists were appointed for Arkansas, Louisiana, Mississippi, Ohio, and South Carolina.

During the period from 1914 to 1918 other collaborating epidemiologists were appointed, bringing the total up to 23, and since that time additional appointments have been made, so that on July 31, 1920, such officers were on duty in 32 States.

In the operation of this plan of having the service officers (collaborating epidemiologists) assigned for duty at the State health offices it was seen that even better results could be obtained in many of the States by extending the plan to include the appointment of assistant collaborating epidemiologists for the major local health jurisdictions; these appointments to be made on the recommendation of the State health officer and the work kept under the supervision of the Public Health Service, acting through the collaborating epidemiologist. Accordingly, during the fiscal year 1917-18 assistant collaborating epidemiologists were appointed, with compensation fixed at the nominal rate of \$1 per annum, for certain local health offices in Alabama, Georgia, and North Carolina. A total of 105 appointments was the number for the three States. Others were appointed during the next year, bringing the total up to 459 in nine States. During this year additions have been made to the list of assistant collaborating epidemiologists until there were on July 31, 1920, 2,803 on duty in various local health offices in 26 of the States.

In connection with the work carried on under this plan commissioned medical officers of the service have been assigned as epidemiologic aids in 11 States, and in 2 of these, Indiana and New Mexico, where no collaborating epidemiologists have been appointed, the commissioned officers are acting also in the capacity of collaborating epidemiologists.

The number of collaborating epidemiologists and assistant collaborating epidemiologists on duty in various States in 1918, 1919, and 1920 is shown in the following table:

States.	Collaborating epidemiologists.			Assistant collaborating epidemiologists.		
	1918	1919	1920	1918	1919	1920
Alabama.....	1	1	1	8	8	67
Arkansas.....	1	1	1			218
California.....			1			290
Connecticut.....	1	1	1			
Delaware.....		1	1			
Florida.....	1	1	1			1
Georgia.....	1	1	1	4	11	20
Illinois.....	1	1	1			101
Indiana.....						543
Iowa.....	1	1	1			
Kansas.....	1	1	1		109	113
Kentucky.....	1	1	1		36	133
Louisiana.....	1	1	1			
Maine.....			1			7
Maryland.....	1	1	1		83	82
Massachusetts.....	1	1	1			209
Michigan.....			1			5
Minnesota.....	1	1	1			1
Mississippi.....	1	1	1			22
Missouri.....	1	1	1			99
Montana.....	1	1	1			
Nebraska.....			1			95
New Jersey.....	1	1	1			
New Mexico.....						66
North Carolina.....	1	1	1	93	106	107
Ohio.....	1	1	1			145
Oklahoma.....	1	1	1			1
South Carolina.....	1	1	1			
Texas.....			1			198
Vermont.....	1	1	1		10	10
Virginia.....	1	1	1			
Washington.....	1	1	1		19	20
West Virginia.....		1	1		77	106
Wisconsin.....			1			144
Total.....	23	26	32	105	459	2,803

The processes involved in the scheme of collecting morbidity data through collaborating epidemiologists and assistant collaborating epidemiologists are indicated in the following general outline:

1. Reports of the occurrence and location of individual cases of communicable diseases by practicing physicians to the assistant collaborating epidemiologists on duty at the local health office, where all the information becomes available for primary use by the local health officer for the control of disease within his jurisdiction.

2. Reports of cases of communicable disease and local health status by the assistant collaborating epidemiologists to the collaborating epidemiologist on duty at the State health office, where the information may be used, in turn, by the State health officer.

3. Reports of cases of disease and general health conditions within States by the collaborating epidemiologists to the Bureau of the Public Health Service for use in the prosecution of interstate health activities and the investigation of the diseases of man in accordance with the act approved August 14, 1912. The reports to the Public Health Service include special telegraphic reports of epidemic or unusual health conditions, weekly summary reports by telegraph of general health conditions of States, and monthly reports of diseases arranged by the places of their occurrence within the States. All of the reports received by the Public Health Service are compiled and published each week in the Public Health Reports. In addition, each State which cooperates furnishes an annual report giving the prevalence of reportable diseases, with the mortality from each of these diseases.

STATE MORBIDITY REPORTS.

TELEGRAPHIC^c REPORTS.

Public Health Service officers stationed throughout the United States and State health officers report immediately by telegraph any unusual prevalence of disease which might spread through interstate traffic and so menace other States than that in which the disease appears. In addition to these emergency reports, regular weekly telegraphic reports of the prevalence of the principal communicable diseases were received by telegraph from 31 States. During the fiscal year seven States were added to those making telegraphic reports, and during June, 1920, the following-named States reported weekly by telegraph:

Alabama.	Louisiana.	North Carolina.
Arkansas.	Maine.	Ohio.
California.	Maryland.	South Dakota.
Connecticut.	Massachusetts.	Texas.
Delaware.	Minnesota.	Vermont.
Florida.	Mississippi.	Virginia.
Georgia.	Montana.	Washington.
Illinois.	Nebraska.	West Virginia.
Indiana.	New Jersey.	Wisconsin.
Iowa.	New Mexico.	
Kansas.	New York.	

These telegraphic reports are preliminary and subject to correction when later reports are received by the State health officers, but they are valuable as giving early information of the presence of communicable diseases.

MONTHLY REPORTS.

More detailed information of the prevalence and geographical distribution of preventable diseases is given in the monthly reports received from State health officers. At the close of the fiscal year these reports were being received from 40 States, the District of Columbia, and Hawaii. During the last two years there has been noticeable improvement in the regularity and value of these reports.

ANNUAL SUMMARIES.

The cases of communicable diseases notified during the calendar year 1919 were reported by 41 States. Deaths registered as due to these diseases were reported by 39 States.

The publication of the annual summaries of cases of communicable diseases and deaths charged to these diseases has been delayed in order that the rates might be computed with the aid of the population figures of the Fourteenth Census.

MORBIDITY REPORTS FROM CITIES.

Morbidity reports have been received weekly from cities which had 10,000 population or over in 1910. These reports include the cases of communicable diseases notified during the week, the number of deaths from all causes, and the number of deaths attributed to each one of the communicable diseases reported. Seven hundred

and eleven cities were furnished cards on which to make these reports.

The following table shows the number of cities reporting during the first six months of 1920 and the classes of data reported:

Reporting deaths (all causes), deaths by diseases, and cases-----	343
Reporting deaths (all causes) and cases-----	22
Reporting deaths (all causes) and deaths by diseases-----	7
Reporting deaths by diseases and cases-----	36
Reporting deaths (all causes) only-----	2
Reporting cases only-----	102
Total number of cities reporting-----	512

The summaries of the prevalence of communicable diseases as reported during the year 1919 in cities of the United States have been delayed because it was necessary to have the figures of the census taken as of January 1, 1920, for the computation of rates.

MORBIDITY REPORTS FROM FOREIGN COUNTRIES.

The publication of reports of the prevalence and geographic distribution of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases in foreign countries was continued throughout the fiscal year. These reports are secured from Public Health Service officers stationed abroad, from American consular officers, and from official reports and publications of foreign countries and municipalities.

The unsettled political conditions of many localities, especially in Europe and Asia, added to the usual difficulties encountered in the endeavor to secure accurate and complete reports of the prevalence of disease. At the same time the necessity of these reports was emphasized by the presence of typhus fever, cholera, and other diseases in various parts of the world and the constant danger that some of these diseases might be imported and gain a foothold in the United States.

SANITARY LEGISLATION.

The compiling of laws, ordinances, and regulations pertaining to public health was discontinued in 1917, owing to the exigencies of war work, but was resumed during the present fiscal year. State public health laws and regulations for the years 1917 and 1918 have been compiled and will appear as Supplements Nos. 37 and 38 to the Public Health Reports, respectively. This legislation is published for the information and guidance of legislators, health officials, and others. The compilations show the trend and progress of public health legislation in the several States and are of assistance to those who are called upon to draft sanitary legislation or to interpret public health laws. Requests for assistance in drafting legislation are complied with whenever possible.

Among the subjects dealt with in the compilations are communicable diseases, hospitals and sanatoria, health authorities, milk, food, water, ice, drugs, school sanitation, sewage disposal, privies and cess-pools, spitting, common drinking cups, common towels, fraudulent advertising, health insurance, and industrial sanitation.

Abstracts of the decisions of the United States courts and State courts of last resort relating to public health matters have been published currently in the Public Health Reports. This information is of value to health officials as showing the interpretation put upon public health legislation by the courts in different States.

PUBLICATION OF SANITARY DATA.

The Division of Sanitary Reports and Statistics issues the weekly Public Health Reports, which contain (1) current information of the prevalence and geographic distribution of preventable diseases in the United States, in so far as data are obtainable, and of smallpox, cholera, plague, yellow fever, typhus fever, and other communicable diseases throughout the world; (2) articles relating to the cause, prevention, or control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The Public Health Reports are intended primarily for distribution to health officers, members of boards or departments of health, and those directly or indirectly engaged in or connected with public health or sanitary work. Articles of general or special interest are issued as reprints from the Public Health Reports or as supplements.

PREVALENCE OF DISEASE IN THE UNITED STATES.

In the preparation of the tables which follow it was necessary to use the estimated populations based on the census of 1910 in computing rates, as the figures of the census of January 1, 1920, were not available when the work was done.

In using these tables it should be borne in mind that morbidity reports are generally incomplete. A relatively large number of reported cases of a communicable disease, as indicated by a high case rate (and more especially when accompanied by a relatively small number of deaths, as indicated by a low fatality rate), usually means that the health department of that State is active and that the cases of the disease are well reported by the practicing physicians. It does not necessarily mean that the disease is more prevalent in that State than in other States. Conversely, a relatively small number of reported cases, when the number of deaths is relatively large (giving a high fatality rate), usually means that the cases were not well reported and does not necessarily show that few cases were present in the State.

ANTHRAX.

Twenty-one States reported anthrax in 1919. Although the number of States reporting this disease to the Public Health Service is greater than ever before, the number of cases is less than for any one of the previous three years. During the year 30 deaths from anthrax were reported from 14 States.

Anthrax—Cases reported by States during 1916, 1917, 1918, and 1919.

State.	1916	1917	1918	1919
California.....	12	23	19	12
Colorado.....		4		1
Connecticut.....	1	1	1	1
Delaware.....	(1)	(1)	(1)	² 1
Georgia.....	(1)	(1)	(1)	5
Hawaii.....			³ 2	
Illinois.....	(1)	2		2
Indiana.....			³ 3	
Iowa.....			³ 3	(1)
Kansas.....	4	2	2	³ 3
Louisiana.....	4	27	13	5
Maine.....			1	1
Maryland.....		1	1	1
Massachusetts.....	31	54	23	18
Minnesota.....				1
Montana.....				2
New Jersey.....	7	21	10	7
New York.....	15	32	20	25
Ohio.....	1	3	2	³ 2
Oklahoma.....	(1)		(1)	⁴ 1
Oregon.....				1
Pennsylvania.....	31	25	11	(1)
Porto Rico.....	(1)		4	
South Carolina.....			1	
Texas.....	(1)	3	4	(1)
Vermont.....		2		³ 1
West Virginia.....	(1)			2
Wisconsin.....		³ 2		³ 3
Total.....	106	202	120	95

¹ No report received.² Nine months only.³ Deaths; cases not reported.⁴ Eleven months only.

CEREBROSPINAL MENINGITIS.

For the calendar year 1919, 28 States reported 2,195 cases of cerebrospinal meningitis, while 20 States reported 943 deaths. The number of cases reported per 1,000 population was 0.034, and the number of deaths was 0.019 per thousand.

In 1918, 23 States reported 4,662 cases of cerebrospinal meningitis with 2,168 deaths, the case rate for these States combined being 0.08 per thousand population and the death rate 0.04 per thousand. The table given below indicates a decided improvement over that year in the number of cases reported and also improvement over the preceding years for which reports are available.

For 1918 the number of fatalities reported per 100 cases in 20 States was 50.4, while in 1919 the fatality rate in 20 States was 53.1.

Cerebrospinal meningitis—Average number of cases reported per annum and average indicated morbidity rates, 1914–1918; cases reported, deaths registered, and indicated morbidity and mortality rates, 1919.

State.	Average.		1919			
	Years included.	Cases reported per annum.		Total cases reported.	Cases per 1,000 population.	Total deaths registered.
		Number.	Per 1,000 population.			Deaths per 1,000 population.
Alabama.....	1915–1918, 4 years.....	84	0.036	80	0.033	52
California.....	1914–1918, 5 years.....	107	.036	104	.032	39.
District of Columbia.....	do.....	34	.093	13	.030	8
Florida.....	1918, 1 year.....	75	.080	34	.035	19
Hawaii.....	1914–1917, 4 years.....	9	.042	8	.035	7
Illinois.....	1914, 1917–1918, 3 years.....	345	.056	175	.027	94
Indiana.....	1914–1918, 5 years.....	81	.029	42	.015	26
Kansas.....	do.....	101	.055	68	.036	40
Louisiana.....	do.....	108	.059	77	.040	27
Maine.....	1917–1918, 2 years.....	16	.021	6	.008	2
Maryland.....	1915–1918, 4 years.....	125	.091	77	.055	42
Massachusetts.....	1916–1918, 3 years.....	241	.064	253	.065	180
Michigan.....	1918, 1 year.....	95	.030	75	.024	.....
Minnesota.....	1914–1918, 5 years.....	106	.046	56	.024	28
Mississippi.....	do.....	64	.033	51	.025	.....
Montana.....	1914, 1916–1918, 4 years.....	12	.026	14	.028	7
New Jersey.....	1918, 1 year.....	265	.086	149	.047	82
New York.....	1914–1918, 5 years.....	443	.043	454	.042	207
North Carolina.....	1918, 1 year.....	123	.050	105	.042	.....
Ohio.....	1914–1918, 5 years.....	302	.059	142	.027	63
Oregon.....	1914, 1916–1918, 4 years.....	6	.007	16	.017	11
Porto Rico.....	1917, 1 year.....	5	.004	2	.002	.....
Rhode Island.....	1916–1918, 3 years.....	49	.078	21	.032	.....
South Dakota.....	1914, 1917–1918, 3 years.....	25	.035	9	.012	.....
Vermont.....	1916–1918, 3 years.....	6	.016	1	.003	1
Virginia.....	1915–1918, 4 years.....	227	.103	110	.049	.....
West Virginia.....	1917–1918, 2 years.....	32	.022	45	.031	.....
Wyoming.....	1914, 1916–1918, 4 years.....	8	.044	8	.041	8
Total.....	.....	3,094	.050	2,195	.034	943
Number of States included.....	.....	28	28	28	28	20

DENGUE.

Dengue was reported as follows: Florida, 26 cases and 1 death; Georgia, 8 cases; Hawaii, 2 cases; Louisiana, 2 cases; Porto Rico, 7 cases.

DIPHTHERIA.

During 1919, 108,008 cases of diphtheria were reported in 37 States, giving a case rate of 1.37 per thousand population. This is a higher rate than the previous year (1.03) or that for the average of the last few years (1.23 per thousand).

Nine thousand one hundred and ninety-three deaths from diphtheria were registered during 1919 in 32 States, giving a death rate of 0.13 per thousand population, which is the same as the previous year. The number of fatalities per 100 cases reported in 1919 was 9.3; in 1918 it was 11.67.

Diphtheria—Average number of cases reported per annum and average indicated morbidity rates, 1914-1918; cases reported, deaths registered, and indicated morbidity and mortality rates, 1919.

State.	Average. Years included.	Cases reported per annum.		1919			
		Num- ber.	Per 1,000 popu- lation.	Total cases re- ported.	Cases per 1,000 popu- lation.	Total deaths regis- tered.	Deaths per 1,000 popu- lation.
Alabama.....	1915-1918, 4 years.....	706	0.30	1,256	0.52	193	0.08
Arkansas.....	1917-18, 2 years.....	230	.13	738	.41	141	.08
California.....	1914-1918, 5 years.....	3,022	1.03	3,073	.96	266	.08
Colorado.....	1914, 1916-1918, 4 years.....	579	.60	557	.54	59	.06
Connecticut.....	1914-1918, 5 years.....	2,282	1.83	3,388	2.59	253	.19
District of Columbia.....	do.....	678	1.86	1,169	2.71	119	.28
Florida.....	1918, 1 year.....	329	.35	510	.53	57	.06
Hawaii.....	1914-1917, 4 years.....	193	.90	154	.68	26	.11
Illinois.....	1914, 1917-18, 3 years.....	10,755	1.74	9,911	1.55	1,020	.16
Indiana.....	1914-1918, 5 years.....	3,280	1.16	2,603	.91	319	.11
Kansas.....	do.....	1,677	.92	2,077	1.10	191	.10
Louisiana.....	do.....	1,083	.59	629	.33	117	.06
Maine.....	1916-1918, 3 years.....	324	.42	363	.46	50	.06
Maryland.....	1915-1918, 4 years.....	1,820	1.33	2,747	1.97	224	.16
Massachusetts.....	1916-1918, 3 years.....	8,175	2.17	7,928	2.04	591	.15
Michigan.....	1914-1918, 5 years.....	5,580	1.83	6,998	2.21	745	.23
Minnesota.....	do.....	3,412	1.50	4,541	1.91	301	.13
Mississippi.....	do.....	1,073	.55	1,676	.83	.....	.....
Montana.....	1914, 1916-1918, 4 years.....	271	.59	366	.73	51	.10
Nebraska.....	1918, 1 year.....	706	.54	423	.32	63	.05
New Jersey.....	1914-1918, 5 years.....	5,938	2.01	7,270	2.31	572	.18
New York.....	do.....	19,632	1.91	25,077	2.31	2,033	.19
North Carolina.....	1918, 1 year.....	1,327	.54	3,519	1.41	.....	.....
North Dakota.....	1917, 1918, 2 years.....	415	.53	394	.48	32	.04
Ohio.....	1914-1918, 5 years.....	7,942	1.54	7,255	1.36	647	.12
Oklahoma.....	1915, 1917, 2 years.....	1,514	.69	704	.29	240	.10
Oregon.....	1914-1918, 5 years.....	263	.31	308	.34	52	.06
Porto Rico.....	1914, 1915, 1917, 1918, 4 years.....	141	.12	98	.08	57	.05
Rhode Island.....	1914, 1916-1918, 4 years.....	1,036	1.68	1,029	1.59	.....	.....
South Carolina.....	1914-1918, 5 years.....	1,554	.96	2,129	1.27	108	.06
South Dakota.....	1914, 1917-18, 3 years.....	232	.33	295	.39	.....	.....
Vermont.....	1914-1918, 5 years.....	406	1.12	204	.56	14	.04
Virginia.....	do.....	2,848	1.30	3,108	1.38	230	.10
Washington.....	do.....	506	.33	1,003	.58	120	.07
West Virginia.....	1917-18, 2 years.....	636	.45	2,244	1.53	.....	.....
Wisconsin.....	1914-1918, 5 years.....	2,148	.86	2,185	.85	267	.10
Wyoming.....	do.....	77	.43	79	.40	15	.08
Total.....	.....	92,790	1.23	108,008	1.37	9,193	.13
Number of States in- cluded.....	.....	37	37	37	37	32	32

INFLUENZA.

During the first four months of 1919 the influence of the 1918 epidemic of influenza was still felt, and many cases and deaths were reported from all parts of the country. During the four-months period 36 States reported more than 800,000 cases of pneumonia (all forms) and influenza and nearly 113,000 deaths from these diseases were registered in 33 States.

These diseases have never been well reported, and the number of cases reported is known to be far below the actual number of cases occurring. It is, however, evident that the disease declined with each recurring wave of the epidemic. The deaths from pneumonia (all forms) and influenza reported to the Public Health Service by

28 States from September 1, 1918, to April 30, 1919, are shown, by months, in the following table:

Deaths from influenza and pneumonia (all forms) in 28 States September, 1918, to April, 1919, inclusive.

Month.	Number of deaths.	Annual death rate per 1,000 population.
September, 1918.....	8,229	1.5
October, 1918.....	140,543	25.1
November, 1918.....	61,186	11.3
December, 1918.....	51,471	9.2
January, 1919.....	43,734	7.8
February, 1919.....	22,959	4.5
March, 1919.....	22,378	4.0
April, 1919.....	12,780	2.4
Total.....	363,280	8.3

Influenza and pneumonia (all forms)—Cases reported in certain States during the first four months of 1919.

State.	January.	February.	March.	April.	Total.
Alabama.....	7,354	2,796	595	302	11,047
Arkansas ¹	4,235	2,146	205	63	6,649
California.....	68,504	3,186	3,266	5,179	80,135
Colorado ¹	2,707	712	958	215	4,592
Connecticut.....	6,976	2,316	1,294	290	10,876
District of Columbia ¹	3,199	476	223	30	3,928
Florida.....	1,402	234	40	220	1,896
Georgia.....	3,938	2,137	878	323	7,276
Hawaii ¹	2,719	4,681	3,992	622	12,014
Illinois.....	16,774	7,396	6,237	1,486	31,893
Indiana.....	11,606	6,135	4,630	1,286	23,657
Kansas ¹	15,742	10,175	13,127	1,956	41,000
Louisiana.....	37,289	2,708	503	184	40,684
Maine.....	2,573	304	162	218	3,257
Maryland.....	18,924	6,247	2,367	770	28,308
Massachusetts ²	29,821	7,098	3,516	1,532	41,967
Michigan ³	463	268	401	185	1,317
Minnesota.....	7,436	1,900	3,037	932	13,305
Mississippi.....	45,769	15,552	4,655	2,174	68,150
Montana.....	1,797	662	2,223	950	5,632
Nebraska.....	12,419	2,924	6,190	1,066	22,599
New Jersey.....	13,843	6,601	4,431	1,852	26,727
New York.....	44,855	17,410	11,033	4,913	78,211
North Carolina.....	9,268	3,831	1,364	678	15,141
North Dakota.....	340	150	84	60	634
Ohio.....	26,871	26,252	29,871	8,441	91,435
Oregon.....	8,974	592	269	391	10,226
Rhode Island ¹	4,456	920	194	30	5,600
South Carolina.....	10,714	719	127	69	11,629
South Dakota.....	6,721	1,026	1,043	672	9,462
Vermont.....	5,332	1,255	1,042	180	7,809
Virginia ¹	40,747	17,711	5,333	1,610	65,401
Washington ⁴	6,917	1,327	792	193	9,229
West Virginia ¹	1,584	1,863	647	161	4,255
Wisconsin ¹	4,148	1,111	1,268	387	6,914
Wyoming.....	131	92	84	55	362
Total.....	486,548	160,913	116,081	39,675	803,217

¹ Cases of influenza only.

² Cases of lobar pneumonia only included with influenza.

³ Cases of pneumonia (all forms) only.

⁴ Cases of pneumonia (all forms) in Seattle not included.

Influenza and pneumonia (all forms)—Deaths registered in certain States during the first four months of 1919.

State.	January.	February.	March.	April.	Total.
Alabama.....	2,116	1,088	499	327	4,030
Arkansas.....	715	380	201	153	1,449
California.....	4,239	650	501	538	5,928
Colorado.....	650	469	596	261	1,976
Connecticut.....	989	536	546	296	2,367
Delaware.....	285	117	67	39	508
District of Columbia.....	411	142	138	53	744
Florida.....	569	341	158	97	1,165
Georgia.....	450	521	309	228	1,508
Hawaii ¹	80	190	154	35	459
Illinois.....	3,330	2,076	2,420	1,096	8,922
Indiana.....	1,459	1,026	1,779	692	4,956
Kansas.....	916	613	1,069	366	2,964
Louisiana.....	2,125	634	349	202	3,310
Maine.....	597	214	245	174	1,230
Maryland.....	1,303	710	371	220	2,604
Massachusetts ²	2,379	971	733	430	4,513
Michigan.....	2,082	1,156	1,102	657	4,997
Minnesota.....	1,176	573	821	485	3,055
Nebraska.....	488	318	527	345	1,678
New Jersey.....	2,086	1,416	1,203	639	5,344
New York.....	7,209	4,811	4,217	2,492	18,729
North Dakota.....	561	212	191	133	1,097
Ohio.....	2,779	2,315	3,089	1,721	9,904
Oklahoma.....	1,232	454	340	228	2,254
Oregon.....	831	133	102	92	1,158
Porto Rico ¹	1,229	416	152	76	1,873
South Carolina.....	1,577	848	354	233	3,012
Vermont.....	158	137	132	92	519
Virginia.....	2,750	1,208	810	409	5,177
Washington.....	1,085	348	251	226	1,910
Wisconsin.....	906	648	949	699	3,202
Wyoming.....	131	92	84	55	362
Total.....	48,893	25,763	24,399	13,789	112,844

¹ Deaths from influenza only.

² Deaths from lobar pneumonia only included with influenza deaths.

LEPROSY.

Reports from State health officers indicate that, during the calendar year 1919, 54 new cases of leprosy were reported in continental United States. On January 1, 1919, 199 cases were reported present, 47 patients died or removed, leaving 206 cases December 31, 1919, including 1 case under investigation. On the latter date 5,108 cases of leprosy were reported present in the Philippine Islands, 37 in Porto Rico, and 685 in Hawaii.

Reports of leprosy, by States, for 1919.

Place.	Present Jan. 1, 1919.	Reported during 1919.	Died, ab- sconded, or re- moved, 1919.	Present Dec. 31, 1919.	Isolated under—	
					State control.	Local control.
California.....	34	16	11	39	.....	39
Los Angeles.....	6	.....	.....
Oakland.....	9	.....	.....
Riverside.....	1	.....	.....
San Francisco.....	22	.....	.....
Santa Clara County.....	1	.....	.....
Colorado.....	3	3	.....	.....	.....
Connecticut.....	3	1	1	3	2	1
Bridgeport isolation hospital.....	1	.....	.....
New Haven isolation hospital.....	2	.....	.....

Reports of leprosy, by States, for 1919—Continued.

Place.	Present Jan. 1, 1919.	Reported during 1919.	Died, ab- sconded, or re- moved, 1919.	Present Dec. 31, 1919.	Isolated under—	
					State control.	Local control.
Florida.....	13			12		
Dade County.....				1		
Investigating.....				1		
Monroe County.....				9		
St. Lucie County.....				1		
Seminole County.....				1		
Hawaii.....	657	86	58	685	628	
Kalawao, Molokai.....				570		
Honolulu (Kalihi Hospital).....				58		
Paroled.....				57		
Illinois.....		2	1	1		
Chicago.....				1		
Louisiana.....	91	16	20	187	87	
Carville (State leper home).....				87		
Massachusetts.....	11	2		13	13	
Dukes County, Penikese Island (leper colony).....				13		
Michigan.....		3	2	1		1
Ann Arbor.....				1		
Houghton (suspected).....				1		
Minnesota.....	9			9		9
Brown County.....				1		
Chippewa County.....				1		
Faribault County.....				1		
Freeborn County.....				2		
Grant County.....				1		
Hennepin County.....				1		
Ramsey County.....				1		
Wright County.....				1		
Mississippi.....	1			1		1
Biloxi.....						
Montana.....	1			1	1	
Alberton, Mineral County.....						
New Jersey.....	4		1	3		3
Passaic.....				1		
Phillipsburg.....				2		
New York.....	26	6	6	26		10
North Dakota.....						
Nelson County.....	1			1		1
Ohio.....			1	1		1
Dayton.....	2					
Oregon.....		1		1		1
Portland, Multnomah County.....						
Philippine Islands.....	5,298	599	642	5,108	4,828	
Culion leper colony.....				4,706		
San Lazaro Hospital.....				122		
In various Provinces.....				30		
Estimated in various Provinces.....				250		
Porto Rico.....	37	4	4	37	37	
San Juan (leper colony).....				37		
South Carolina.....	2			2		
Abbeville.....				1		
Georgetown.....				1		

¹ Seven of these said to be cured.² Leprosy is not reportable in New York outside of New York City

Reports of leprosy, by States, for 1919—Continued.

Place.	Present Jan. 1, 1919.	Reported during 1919.	Died, ab- sconded, or re- moved, 1919.	Present Dec. 31, 1919.	Isolated under—	
					State control.	Local control.
Virginia:						
Henrico County.....	1			1		1
Washington.....		2		2		2
Olympia.....				1		
Yakima.....				1		
Wisconsin.....		2	1	1		
Rock County.....				1		

Reports of leprosy, by cities, for 1919.

City.	Present Jan. 1, 1919.	Reported during 1919.	Died, ab- sconded, or re- moved, 1919.	Present Dec. 31, 1919.	Isolated under local control.
Ann Arbor, Mich.....		1		1	1
Baltimore, Md.....	1		1		
Belmont, N. J.....		1		1	
Benton Harbor, Mich.....		1	1		
Boston, Mass.....		3	3		
Bridgport, Conn.....	1			1	1
Chicago, Ill.....		1		1	1
Dayton, O.....	2		1	1	1
Galveston, Tex.....	15	11	1	25	1
Hartford, Conn.....		1	1		
Houston, Tex.....		2	1	1	
Long Beach, Calif.....		2	2		
Louisville, Ky.....	1			1	
Milwaukee, Wis.....	1		1	1	1
New Haven, Conn.....	1			1	
New Orleans, La.....		10	10		
Passaic, N. J.....	1			1	1
Philadelphia, Pa.....		5	5		
Phillipsburg, N. J.....	2			2	2
Portland, Oreg.....		1	1		
Richmond, Va.....	1			1	1
Riverside, Calif.....	1			1	
Sacramento, Calif.....		1	1		
St. Louis, Mo.....	2	1	1	2	2
San Antonio, Tex.....	18	1	3	16	
San Francisco, Calif.....	20	7	5	22	22
Temple, Tex.....		1		1	1
Yakima, Wash.....		1		1	1

¹ Estimated.

MEASLES.

In 1919, 37 States reported 132,431 cases of measles, a reduction from the average of the last few years in the same States of more than 64 per cent. The highest indicated case rates were in Connecticut, 4.5 per thousand population, and Vermont, 3.9 per thousand. In the 37 States there were reported 1.7 cases per thousand population, as compared with an average of 4.9 per thousand for the last few years.

Thirty-two States reported 2,040 deaths from measles, giving a death rate of 3 per hundred thousand population, which is far below the usual death rate for this disease, and less than one-third of the death rate reported by 30 States for the year 1918.

The fatality rate in these States was 1.7 per hundred cases. This is considerably lower than the rate for 1918.

Measles—Average number of cases reported per annum and average indicated morbidity rates, 1914–1918; cases reported, deaths registered, and indicated morbidity and mortality rates, 1919.

State.	Average.		1919.				
	Years included.	Cases reported per annum.		Total cases reported.	Cases per 1,000 population.	Total deaths registered.	Deaths per 1,000 population.
		Num-ber.	Per 1,000 population.				
Alabama.....	1915–1918, 4 years.....	6,741	2.9	1,106	0.5	54	0.02
Arkansas.....	1917–1918, 2 years.....	6,590	3.7	615	.3	51	.03
California.....	1914–1918, 5 years.....	14,276	4.9	3,969	1.2	14	.....
Colorado.....	1914, 1916–1918, 4 years.....	5,259	5.4	146	.1	3	.....
Connecticut.....	1914–1918, 5 years.....	6,336	5.1	5,884	4.5	99	.08
District of Columbia.....	.....do.....	3,267	9.0	187	.4	1	.....
Florida.....	1918, 1 year.....	2,187	2.3	775	.8	43	.04
Hawaii.....	1914–1917, 4 years.....	763	3.6	135	.6	1	.....
Illinois.....	1914, 1917–1918, 3 years.....	23,461	3.8	18,844	2.9	298	.05
Indiana.....	1914–1918, 5 years.....	15,686	5.6	5,055	1.8	70	.02
Kansas.....	.....do.....	11,623	6.4	998	.5	12	.01
Louisiana.....	.....do.....	3,798	2.1	418	.2	30	.02
Maine.....	1916–1918, 3 years.....	1,937	2.5	55	.1	4	.01
Maryland.....	1915–1918, 4 years.....	10,709	7.8	3,709	2.7	44	.03
Massachusetts.....	1916–1918, 3 years.....	26,184	6.9	9,984	2.6	183	.05
Michigan.....	1914–1918, 5 years.....	8,405	2.8	7,096	2.2	170	.05
Minnesota.....	.....do.....	5,436	2.4	4,469	1.9	101	.04
Mississippi.....	.....do.....	22,815	11.7	3,215	1.6	.....	.....
Montana.....	1914, 1916–1918, 4 years.....	2,824	6.1	807	1.6	10	.02
Nebraska.....	1918, 1 year.....	1,584	1.2	655	.5	3	.....
New Jersey.....	.....do.....	28,437	9.2	4,774	1.5	55	.02
New York.....	1914–1918, 5 years.....	62,562	6.1	19,882	1.8	355	.03
North Carolina.....	1918, 1 year.....	8,069	3.3	5,768	2.3	.....	.....
North Dakota.....	1917–1918, 2 years.....	875	1.1	552	.7	10	.01
Ohio.....	1914–1918, 5 years.....	26,316	5.1	16,788	3.1	197	.04
Oklahoma.....	1915, 1917, 2 years.....	6,101	2.8	519	.2	37	.02
Oregon.....	1914–1918, 5 years.....	2,917	3.5	407	.4	3	.....
Porto Rico.....	1917–1918, 2 years.....	4,374	3.5	133	.1	20	.02
Rhode Island.....	1914, 1916–1918, 4 years.....	1,829	3.0	218	.3	.....	.....
South Carolina.....	1914–1918, 5 years.....	2,805	1.7	359	.2	8	.....
South Dakota.....	1914, 1917–1918, 3 years.....	963	1.4	157	.2	.....	.....
Vermont.....	1914–1918, 5 years.....	2,971	8.2	1,448	3.9	16	.04
Virginia.....	1915–1918, 4 years.....	18,448	8.4	4,823	2.1	73	.03
Washington.....	1914–1918, 5 years.....	9,012	5.9	1,894	1.1	20	.01
West Virginia.....	1917–1918, 2 years.....	2,680	1.9	1,898	1.3	.....	.....
Wisconsin.....	1914–1918, 5 years.....	10,355	4.1	4,342	1.7	54	.02
Wyoming.....	.....do.....	727	4.0	347	1.8	1	.01
Total.....	.....	369,322	4.9	132,431	1.7	2,040	.03
Number of States included.....	.....	37	37	37	37	32	32

POLIOMYELITIS (INFANTILE PARALYSIS).

The number of cases of poliomyelitis reported during the calendar year 1919 in 30 States was less than 25 per cent of the average number for the last few years, but this is accounted for by the fact that in 1916 a serious epidemic of this disease appeared in many parts of the country.

In 1918, 25 States reported 1,880 cases of poliomyelitis, and in 1919 the same States reported 1,686 cases.

The fatality rate in 1919 was 30.2 deaths per hundred cases, while in 1918, 33.9 deaths were reported per hundred cases.

Poliomylitis (infantile paralysis)—Average number of cases reported per annum and average indicated morbidity rates, 1914–1918; cases reported, deaths registered, and indicated morbidity and mortality rates, 1919.

State.	Average. Years included.	Cases reported per annum.		1919.			
		Num- ber.	Per 1,000 popu- lation.	Total cases re- ported.	Cases per 1,000 popu- lation.	Total deaths regis- tered.	Deaths per 1,000 popu- lation.
Alabama.....	1915-1918, 4 years.....	63	0.027	35	0.014	22	0.009
Arkansas.....	1917-18, 2 years.....	7	.004	12	.007	11	.006
California.....	1914-1918, 5 years.....	78	.027	27	.008	9	.003.
Connecticut.....	do.....	216	.174	12	.009	10	.008
District of Columbia.....	do.....	12	.033	11	.025	.....	.....
Illinois.....	1914, 1917-18, 3 years.....	433	.070	273	.043	123	.019
Indiana.....	1914-1918, 5 years.....	86	.030	32	.011	26	.009
Kansas.....	do.....	56	.031	61	.032	15	.008
Louisiana.....	do.....	28	.015	31	.016	9	.005
Maine.....	1916-1918, 3 years.....	55	.071	4	.005	2	.003
Maryland.....	1915-1918, 4 years.....	149	.109	111	.080	34	.024
Massachusetts.....	1916-1918, 3 years.....	733	.194	66	.017	17	.004
Michigan.....	1914-1918, 5 years.....	182	.060	105	.033	.....	.....
Minnesota.....	do.....	242	.106	85	.036	16	.007
Mississippi.....	do.....	116	.059	76	.038	.....	.....
Montana.....	1914, 1916-1918, 4 years.....	35	.076	9	.018	2	.004
Nebraska.....	1918, 1 year.....	10	.008	34	.026	3	.002
New Jersey.....	1914-1918, 5 years.....	851	.289	44	.014	12	.004
New York.....	do.....	2,846	.277	146	.013	31	.003
North Carolina.....	1918, 1 year.....	22	.009	43	.017	.....	.....
Ohio.....	1914-1918, 5 years.....	316	.061	98	.018	36	.007
Oregon.....	1915-1918, 4 years.....	16	.019	2	.002	0	.....
Rhode Island.....	1917-18, 2 years.....	10	.016	2	.003	.....	.....
South Dakota.....	do.....	29	.040	14	.019	.....	.....
Vermont.....	1914-1918, 5 years.....	117	.322	15	.041	0	.....
Virginia.....	1915-1918, 4 years.....	231	.105	143	.063	17	.007
Washington.....	1914-1916, 1918, 4 years.....	21	.014	16	.009	7	.004
West Virginia.....	1917-18, 2 years.....	181	.127	61	.042	.....	.....
Wisconsin.....	1914-1918, 5 years.....	169	.068	226	.088	46	.018
Wyoming.....	1916-1918, 3 years.....	3	.016	1	.005	1	.005
Total.....	.....	7,313	.108	1,795	.025	449	.008
Number of States in- cluded.....	.....	30	30	30	30	23	23

RABIES IN MAN.

Deaths from rabies registered in 1919 were as follows: Ohio, 9; New York, 7; Missouri, 5; Illinois, 4; Florida, Louisiana, Georgia, Kansas, and South Carolina, 2 each; Colorado, Delaware, Indiana, Maryland, Massachusetts, New Jersey, Oklahoma, Virginia, and Washington, 1 each; total, 44.

ROCKY MOUNTAIN SPOTTED (OR TICK) FEVER.

In six far Western and Northwestern States during 1919, 27 cases of Rocky Mountain spotted fever were reported, while in 1918, 20 cases were reported in five States, and in 1917, 56 cases in seven States. Nineteen deaths from the disease were registered in 1919 in four of these States, giving a fatality rate of 70.37 per cent.

The highest case rates were reported from Montana (0.026 per 1,000 population) and Oregon (0.006).

The reported cases of Rocky Mountain spotted fever all occurred in the months from April to December, as follows: April, 6; May, 7; June, 8; July, 4; September, 1; December, 1.

SCARLET FEVER.

In 1919, 37 States reported 90,612 cases of scarlet fever, which is more than the average number of cases reported annually by the same States for the preceding five years (87,069 cases), but the increase was less proportionately than the estimated increase in the population. Consequently the number of cases per thousand population is slightly less for 1919 than the average for the preceding years.

Thirty-one States reported 1,794 deaths from scarlet fever in 1919, giving a death rate of 2.5 per hundred thousand population and a fatality rate of 2.1 deaths per hundred cases.

Scarlet fever—Average number of cases reported per annum and average indicated morbidity rates, 1914–1918; cases reported, deaths registered, and indicated morbidity and mortality rates, 1919.

State.	Average.		1919.			
	Years included.	Cases reported per annum.		Total cases reported.	Cases per 1,000 population.	Deaths per 1,000 population.
		Number.	Per 1,000 population.			
Alabama.....	1915–1918, 4 years.....	703	0.3	647	0.3	16
Arkansas.....	1917–18, 2 years.....	321	.2	628	.3	8
California.....	1914–1918, 5 years.....	3,447	1.2	2,870	.9	55
Colorado.....	1914, 1916–1918, 4 years.....	1,125	1.2	998	1.0	31
Connecticut.....	1914–1918, 5 years.....	1,580	1.3	2,663	2.0	46
District of Columbia.....	do.....	620	1.7	665	1.5	3
Florida.....	1918, 1 year.....	138	.1	146	.2	4
Hawaii.....	1914–1917, 4 years.....	8	.....	21	.1	.....
Illinois.....	1914, 1917–18, 3 years.....	10,590	1.7	7,334	1.1	218
Indiana.....	1914–1918, 5 years.....	4,147	1.5	4,105	1.4	79
Kansas.....	do.....	2,241	1.2	2,791	1.5	49
Louisiana.....	do.....	185	.1	257	.1	2
Maine.....	1916–1918, 3 years.....	244	.3	879	1.1	11
Maryland.....	1915–1918, 4 years.....	1,759	1.3	5,507	3.9	52
Massachusetts.....	1916–1918, 3 years.....	5,570	1.5	8,019	2.1	130
Michigan.....	1914–1918, 5 years.....	6,059	2.0	5,398	1.7	167
Minnesota.....	do.....	4,328	1.9	2,657	1.1	96
Mississippi.....	do.....	504	.3	1,256	.6	.....
Montana.....	1914, 1916–1918, 4 years.....	1,034	2.2	1,901	3.8	50
Nebraska.....	1918, 1 year.....	1,429	1.1	757	.6	21
New Jersey.....	1914–1918, 5 years.....	4,572	1.6	4,240	1.3	70
New York.....	do.....	14,191	1.4	12,075	1.1	268
North Carolina.....	1918, 1 year.....	804	.3	1,512	.6	.....
North Dakota.....	1917–18, 2 years.....	609	.8	800	1.0	28
Ohio.....	1914–1918, 5 years.....	8,602	1.7	8,017	1.5	135
Oklahoma.....	1915, 1917, 2 years.....	1,813	.8	581	.2	16
Oregon.....	1914–1918, 5 years.....	590	.4	1,084	1.1	12
Porto Rico.....	1914, 1917, 2 years.....	2	.....	8	.....	1
Rhode Island.....	1914, 1916–1918, 4 years.....	798	1.3	792	1.2	.....
South Carolina.....	1914–1918, 5 years.....	259	.2	175	.1	1
South Dakota.....	1914, 1917–18, 3 years.....	706	1.0	1,063	1.4	.....
Vermont.....	1914–1918, 5 years.....	526	1.4	388	1.1	9
Virginia.....	do.....	1,422	.6	1,872	.8	28
Washington.....	do.....	1,202	.8	2,483	1.4	40
West Virginia.....	1917–18, 2 years.....	479	.3	2,223	1.5	.....
Wisconsin.....	1914–1918, 5 years.....	4,121	1.6	3,776	1.5	114
Wyoming.....	do.....	341	1.9	74	.4	4
Total.....	.....	87,069	1.2	90,612	1.1	1,794
Number of States included.....	.....	37	37	37	37	31

SMALLPOX.

During the calendar year 1919, 53,344 cases of smallpox were reported in 36 States, an increase of nearly 15 per cent over the average number of cases reported during the last few years.

A noteworthy increase in the prevalence of this disease occurred on the Pacific coast. California, Washington, and Oregon reported 9,021 cases in 1919, as compared with 3,238 cases in 1918 and an annual average for the five years preceding 1919 of 1,625 cases.

The disease was generally of the mild type, which has been prevalent in the United States for many years, but in Louisiana 172 deaths were registered, although only 1,226 cases were reported. The fatality rate in 27 States (excluding Louisiana) was less than 0.3 per 100 cases.

Smallpox—Average number of cases reported per annum and average indicated morbidity rates, 1914-1918; cases reported, deaths registered, and indicated morbidity and mortality rates, 1919.

State.	Average. Years included.	Cases reported per annum.		1919.			
		Num- ber.	Per 1,000 popu- lation.	Total cases re- ported.	Cases per 1,000 popu- lation.	Total deaths re- corded.	Deaths per 1,000 popu- lation.
Alabama.....	1915-1918, 4 years.....	1,364	0.56	935	0.39	5	0.092
Arkansas.....	1917-18, 2 years.....	2,393	1.29	588	.32	5	.003
California.....	1914-1918, 5 years.....	529	.18	2,002	.62	5	.002
Colorado.....	1914, 1916-1918, 4 years.....	637	.16	1,715	1.65	4	.004
Connecticut.....	1914-1918, 5 years.....	12	.13	6	.....	0	.....
District of Columbia.....	do.....	46	.13	173	.49	.....	.....
Florida.....	1918, 1 year.....	59	.04	45	.05	.....	.....
Illinois.....	1914, 1917-18, 3 years.....	425	.19	3,334	.72	5	.001
Indiana.....	1914-1918, 5 years.....	3,755	1.34	2,863	1.33	12	.004
Kansas.....	do.....	3,23	1.78	2,437	1.28	1	.001
Louisiana.....	do.....	708	.59	1,224	.64	172	.090
Maine.....	1917-18, 2 years.....	593	.73	443	.56	2	.003
Maryland.....	1915-1918, 4 years.....	120	.09	229	.16	0	.....
Massachusetts.....	1916-1918, 3 years.....	41	.01	49	.01	2	.001
Michigan.....	1914-1918, 5 years.....	2,211	.72	2,469	.78	8	.003
Minnesota.....	do.....	1,939	.86	2,448	1.03	9	.004
Mississippi.....	do.....	2,033	1.04	2,502	1.23	.....	.....
Montana.....	1914, 1916-1918, 4 years.....	1,082	2.34	970	1.54	6	.012
Nebraska.....	1918, 1 year.....	3,906	3.01	2,844	2.17	1	.001
New Jersey.....	1914-1918, 5 years.....	71	.02	109	.03	0	.....
New York.....	do.....	39	.04	101	.02	.....	.....
North Carolina.....	1918, 1 year.....	899	.36	2,321	.93	.....	.....
North Dakota.....	1917-18, 2 years.....	455	.58	211	.26	0	.....
Ohio.....	1914-1918, 5 years.....	5,080	.60	4,107	.77	10	.002
Oklahoma.....	1915, 1917, 2 years.....	3,660	1.66	2,159	.88	13	.005
Oregon.....	1911-1918, 5 years.....	355	.42	2,129	2.87	2	.002
Porto Rico.....	1917-18, 2 years.....	56	.05	19	.01	1	.001
Rhode Island.....	1918, 1 year.....	2	.....	5	.....	.....	.....
South Carolina.....	1911-1918, 5 years.....	290	.18	394	.18	2	.001
South Dakota.....	1914, 1917-18, 3 years.....	1,195	1.70	920	1.22	.....	.....
Vermont.....	1911-1918, 5 years.....	12	.28	5	.01	6	.....
Virginia.....	do.....	1,41	.14	1,912	.87	11	.004
Washington.....	do.....	741	.48	4,799	2.55	7	.004
West Virginia.....	1917-18, 2 years.....	539	.50	2,217	1.71	.....	.....
Wisconsin.....	1914-1918, 5 years.....	1,96	.79	3,278	1.27	4	.002
Wyoming.....	do.....	118	.16	276	1.41	1	.015
Total.....	.....	41,555	.62	53,344	.68	287	.005
Number of States in- cluded.....	.....	36	36	36	36	28	28

The vaccination histories of cases of smallpox for the calendar year 1919 was furnished by 10 States in which 18,123 cases of smallpox occurred. Of these, 64 per cent had never been successfully vaccinated, 4 per cent were last vaccinated more than 7 years preceding attack, 5 per cent were said to have been vaccinated within 7 years of the onset of the disease, and the vaccination history was not obtained or was uncertain in 27 per cent of the cases.

Vaccination history of smallpox cases, 1919.¹

Place.	New cases reported.	Deaths.	Vaccination history of cases.			
			Number vaccinated within 7 years preceding attack.	Number last vaccinated more than 7 years preceding attack.	Number never successfully vaccinated.	Vaccination history not obtained or uncertain.
California.....	1,992	3	52	120	1,630	190
Colorado.....	1,714	.....	86	55	1,317	256
District of Columbia.....	173	1	.....	9	164	.....
Florida.....	42	.....	7	2	29	4
Kansas.....	2,388	.....	34	56	1,359	939
Massachusetts.....	38	.....	4	3	30	1
Michigan.....	2,285	.....	190	113	1,744	238
Minnesota.....	2,280	.....	31	117	2,062	70
Ohio.....	3,924	.....	31	104	1,876	1,913
Wisconsin.....	3,287	.....	474	144	1,403	1,266
Total.....	18,123	4	909	723	11,614	4,877

¹ This table was compiled from monthly reports, and includes all cases for which the vaccination histories were given in the reports from the States to the Public Health Service.

TYPHOID FEVER.

For a long time the number of cases of typhoid fever in the United States and the deaths from this disease have been decreasing. In 1918, 27 States reported 33,737 cases of typhoid fever, and in 1919 the same States reported 27,884 cases, a decrease of 17.3 per cent.

In 37 States the average number of cases of typhoid fever reported per annum during the last five years was 50,987. In 1919 these States reported 32,834 cases, a decrease of nearly 36 per cent.

During 1919, 5,296 deaths from typhoid fever were reported in 32 States, giving an indicated fatality rate of 21.5 per hundred cases.

Even when allowances are made for the incompleteness of the figures, owing to the fact that many cases of typhoid fever are not reported, these figures show encouraging progress in the control of the disease.

Typhoid fever—Average number of cases reported per annum and average indicated morbidity rates, 1914-1918; cases reported, deaths registered, and indicated morbidity and mortality rates, 1919.

State.	Average.		1919				
	Years included.	Cases reported per annum.		Total cases reported.	Cases per 1,000 population.	Total deaths registered.	Deaths per 1,000 population.
		Num-ber.	Per 1,000 population.				
Alabama.....	1915-1918, 4 years.....	2,840	1.2	1,073	0.4	332	0.14
Arkansas.....	1917-18, 2 years.....	624	.4	677	.4	178	.10
California.....	1914-1918, 5 years.....	1,322	.4	964	.3	185	.06
Colorado.....	1914, 1916-1918, 4 years.....	501	.5	216	.2	79	.08
Connecticut.....	1914-1918, 5 years.....	641	.5	415	.3	56	.04
District of Columbia.....	do.....	312	.9	153	.4	16	.18
Florida.....	1918, 1 year.....	485	.5	536	.6	176	.18
Hawaii.....	1914-1917, 4 years.....	213	1.0	173	.8	43	.19
Illinois.....	1914, 1917-1918, 3 years.....	2,547	.4	1,200	.2	377	.06
Indiana.....	1914-1918, 5 years.....	2,121	.8	974	.3	337	.12
Kansas.....	do.....	1,892	1.0	836	.4	134	.07
Louisiana.....	do.....	1,192	.7	1,253	.7	400	.21
Maine.....	1916-1918, 3 years.....	199	.3	251	.3	44	.06
Maryland.....	1915-1918, 4 years.....	2,477	1.8	1,616	1.2	170	.12
Massachusetts.....	1916-1918, 3 years.....	1,375	.4	940	.2	102	.03
Michigan.....	1914-1918, 5 years.....	1,676	.5	940	.3	264	.08
Minnesota.....	do.....	1,013	.4	641	.3	78	.03
Mississippi.....	do.....	5,769	3.0	3,611	1.8	.....	.....
Montana.....	1914, 1916-1918, 4 years.....	414	.9	274	.5	42	.08
Nebraska.....	1918, 1 year.....	156	.1	110	.1	45	.03
New Jersey.....	1914-1918, 5 years.....	1,259	.4	617	.2	92	.03
New York.....	do.....	4,601	.4	2,551	.2	372	.03
North Carolina.....	1918, 1 year.....	3,388	1.4	2,956	1.2	.....	.....
North Dakota.....	1917-1918, 2 years.....	178	.2	139	.2	20	.02
Ohio.....	1914-1918, 5 years.....	3,923	.8	2,708	.5	460	.09
Oklahoma.....	1915, 1917, 2 years.....	1,487	.7	1,175	.5	321	.13
Oregon.....	1914-1918, 5 years.....	228	.3	134	.1	36	.04
Porto Rico.....	1914, 1915, 1917, 1918, 4 years.....	328	.3	189	.1	82	.06
Rhode Island.....	1914, 1916-1918, 4 years.....	216	.3	89	.1	.....	.....
South Carolina.....	1914-1918, 5 years.....	954	.6	633	.4	355	.21
South Dakota.....	1914, 1917-1918, 3 years.....	112	.2	113	.1	.....	.....
Vermont.....	1914, 1915, 1917, 1918, 4 years.....	194	.5	79	.2	12	.03
Virginia.....	1914-1918, 5 years.....	3,626	1.7	2,456	1.1	333	.15
Washington.....	do.....	769	.5	379	.2	49	.03
West Virginia.....	1917-1918, 2 years.....	1,328	.9	1,510	1.0	.....	.....
Wisconsin.....	1914-1918, 5 years.....	561	.2	215	.1	85	.03
Wyoming.....	do.....	66	.4	38	.2	21	.11
Total.....	.....	50,987	.7	32,834	.4	5,296	.07
Number of States included.....	.....	37	37	37	37	32	32

TYPHUS FEVER.

During 1919 a total of 6 cases of typhus fever was reported, with 4 deaths, from the States of California, Colorado, Florida, Maryland, and Oklahoma. In 1918, 29 cases were reported from 8 States, and 58 cases from 5 States in 1917.

WORLD PREVALENCE OF CHOLERA, PLAGUE, TYPHUS FEVER, AND YELLOW FEVER.

Prevalence of cholera, plague, typhus fever, and yellow fever was reported for the period ended June 30, 1920, in areas in which these diseases have been recognized as endemic. Some unusual outbreaks were noted. Plague made its appearance in Mexico at Tampico and Vera Cruz. Occurrence of cholera was reported on

a vessel from Shanghai, August 17, 1919. Plague was reported on five vessels from July to December, 1919, and on two vessels in the months of February and March, 1920.

Reports of cholera and typhus fever in countries of Eastern Europe are not sufficiently complete to supply accurate data with regard to the prevalence of these diseases during the period under report. The information contained in the Public Health Reports is based mainly on reports received from medical officers of the Public Health Service and American consuls. The statements of disease prevalence are of value as indicating areas of prevalence and the unusual occurrence of outbreaks rather than as supplying accurate data of the extent of the prevalence.

CHOLERA.

EUROPE.

Countries in which cholera was reported present: Greece, Poland, Russia, and Turkey.

Greece.—Saloniki, October, 1919, one case.

Poland.—Present in November, 1919, at Garwolin, Kowal, and Stryi.

Russia.—Novorossisk, in November, 1919, 3 cases; Odessa, October and November, 1919, 93 cases; Sebastopol district, June, 1920, present and increasing.

Turkey.—Constantinople, present in July, 1919; Rodosto, present in December, 1919.

ASIA.

Countries in which cholera was reported present: Ceylon, China, Chosen (Korea), India, Indo-China, Japan, Java, Mesopotamia, Siam, Straits Settlements, Sumatra, the Philippine Islands, and Asiatic Turkey.

Ceylon.—Outbreak with spread at Hambantota in July, 1919.

China.—Amoy, July to November, 1919, 730 fatal cases, in April, 1920, 2 fatalities; Antung, August to October, 1919, 1,155 cases; Canton, June 29 to October 18, 1919, 16 cases, and in August, 1919, present in the foreign section, Island of Shamien; Chefoo, August and September, 1919, a daily average of about 50 fatalities reported; Chungking, May 7 to 13, 1920, present with approximately 50 fatalities, during the third week in May with 551 fatalities, and from May 31 to June 5, 1920, with 788 fatalities; Foochow, July 10 to 16, a daily average of about 100 cases; July 26, a daily average reported of 30 cases with 5 fatal cases among Europeans, and in August present in epidemic form; Hankow, 1 case in September, 1919; Hongkong, July to November, 1919, 43 cases; Manchuria, present at Dairen in August, 1919, and in September present with 192 cases; at Harbin, epidemic in August, 1919, with an estimated number of from 150 to 200 fatalities; Mukden, present in September, 1919; Peking, 1 case in a foreigner in August, 1919; Shanghai, choleraic disease prevalent in July, 1919, and present in August with 7 cases; Swatow, July and August, 1919, 120 cases, September, 1919, 5 cases; Sze-Chuen Province, in June, 1920, 50 fatal cases; Tientsin, August

and September, 1919, 245 cases occurring in the foreign concessions and the native city; Tsinanfu, August and September, 1919, 32 cases; Tsingtau, July and August, 1919, 140 cases; Ungkung, August 16, 1919, present.

Chosen (Korea).—From August 15 to November 16, 1919, 15,192 cases with 9,823 fatalities were reported from 13 Provinces.

India.—October 19 to December 27, 1919, 23,388 cases with fatal termination; January 4 to June 12, 1920, 32,356 fatal cases. Occurrence in cities: Bombay, June 28 to November, 1919, 202 cases; January 11 to June 12, 1920, 80 cases. Calcutta, June 29 to December 27, 1919, 394 cases; December 28, 1919, to May 29, 1920, 1,013 cases. Karachi, July 24 to 30, 1919, 3 cases. Madras, July 12 to December 27, 1919, 73 cases; December 28, 1919, to June 19, 1920, 43 cases. Rangoon, June 29 to December 27, 1919, 93 cases; December 28, 1919, to June 5, 1920, 31 cases.

Indo-China.—Saigon, July 28 to November 23, 1919, 55 cases; June 7 to 13, 1920, 74 cases.

Japan.—Hiroshima, June 6 to 12, 1920, 6 cases; Kobe, September 21 to November 30, 1919, 27 cases; Kochi, June 6 to 12, 1920, 1 case; Nagasaki, 7 cases occurring late in June, 1920; Pescadores Island, July 14, 1920, 40 cases occurring in one village; Taiwan Island (Formosa) July and August, 1919, 398 cases; October 29 to November 30, 1919, 651 cases; April, 1920, 23 cases; May 26, 1920, present; May 22 to June 30, 1920, 60 cases; Tokyo, present in August and November, 1919; Yokohama, September, 1919, 1 case on a fishing vessel.

Java.—East Java, June 25 to July 15, 1919, 16 cases; October 5 to 11, 1 death. West Java, July 18 to December 25, 1919, 46 cases (Batavia, 23 cases); January 24 to June 3, 1920, 14 cases (Batavia, 9 cases).

Mesopotamia.—Basra, July 20 to 26, 1919, 1 case.

Philippine Islands.—June 29 to December 27, 1919, 21,353 cases with 15,085 fatalities; December 28, 1919, to June 26, 1920, 1,042 cases with 715 fatalities. Manila, June 29 to December 27, 1919, 765 cases, 352 fatalities; December 28, 1919, to June 26, 1920, 12 cases with 2 fatalities.

Siam.—Bangkok, June 30 to December 27, 1919, 243 cases; December 28, 1919, to June 12, 1920, 1,145 cases.

Straits Settlements.—Singapore, July 14 to December 27, 1919, 152 cases; December 28, 1919, to March 13, 1920, 8 cases.

Sumatra.—Deli, October, 1919, 1 case; Medan, June 29 to November 30, 1919, 47 cases.

Turkey.—Amasia, December, 1919, 1 case; Kaiseria, December 22, 1919, 1 case; January, 1920, 1 case; Mamuret-ul-Aziz, December, 1919, 1 case; Panderma, December, 1919, to January, 1920, 16 cases; Smyrna, December, 1919, 3 cases.

PLAGUE.

EUROPE.

Countries in which plague was reported: France, Great Britain, Greece, Italy, Spain, Russia, and Turkey.

France.—Marseille, August 16 to 27, 1919, 11 cases, with 3 fatalities.

Great Britain.—Liverpool, July, 1919, and June, 1920, 1 fatal case each.

Greece.—Athens, October, 1919, 5 cases; Canea, May 28, 1920, 2 cases; Piræus, October, 1919, 2 cases, and April and May, 1920, 7 cases; Saloniki, October to December, 1919, 19 cases.

Italy.—Catania, present in June, 1920.

Russia.—Odessa, April 17, 1920, present.

Spain.—Barcelona, September and October, 1919, 10 cases.

Turkey.—Constantinople, present in October, 1919; in November and December, 1919, 11 cases.

ASIA.

Countries in which plague was reported: Ceylon, China, India, Indo-China, Java, Mesopotamia, Siam, Straits Settlements, and Syria.

Ceylon.—Colombo, August 10 to December 27, 1919, 52 cases; December 28, 1919, to June 12, 1920, 57 cases.

China.—Amoy, August and September, 1919, present; Hongkong, June 29 to December 7, 1919, 38 cases; February 1 to 7, 1920, 1 case; April 4 to June 26, 1920, 90 cases.

India.—June 29 to December 27, 1919, cases, 47,207; deaths, 25,981; December 28, 1919, to March 20, 1920, 76,475 cases, 70,320 deaths; March 28 to June 26, 1920, 33,310 cases, 24,559 deaths. These figures are taken from preliminary statements of plague occurrence and are subject to later correction. Occurrence in cities was reported as follows: Bombay, June 29 to December 27, 1919, 74 cases; fatalities, 53; January 4 to June 12, 1920, 198 cases; fatalities, 149. Calcutta, June 28 to August 2, 1919, 22 fatal cases; January 25 to June 12, 1920, 63 cases, 50 fatalities. Karachi, June 29 to November 29, 1919, 69 cases, 58 fatalities; January 11 to June 19, 1920, 349 cases, 287 fatalities. Madras, January 25 to February 14, 1920, 4 cases. Madras Presidency, July 6 to December 27, 1919, 3,104 cases, 2,030 fatalities; December 28, 1919, to June 26, 1920, 4,979 cases, with 3,644 fatalities. Rangoon, July 6 to December 27, 1919, 305 cases, with 179 fatalities; December 28, 1919, to June 12, 1920, 784 cases, with 742 fatalities.

Indo-China.—Saigon, July 28 to December 7, 1919, 28 cases; January 26 to February 7, 1920, 1 case; May 10 to June 13, 1920, 9 cases.

Java.—East Java, Surabaya district, July 23 to December 31, 1919, 1,553 cases, with 1,552 fatalities; January 1 to May 19, 1920, 109 cases.

Mesopotamia.—Bagdad, July 19 to August 2, 1919, 3 cases; January 3 to 9, 1920, 1 case. Basra, July 20 to October 24, 1919, 4 cases; total from date of outbreak, March 19 to June 24, 1920, 396 cases, with 256 fatalities.

Siam.—Bangkok, September 28 to October 4, 1919, 1 fatal case; December, 1919, 4 cases; February 1 to June 5, 1920, 55 cases, with 48 fatalities.

Straits Settlements.—Singapore, July 14 to December 27, 1919, 19 cases; January 4 to April 24, 1920, 45 cases.

Syria.—Beirut, October to December, 1919, 53 cases; June 30, 1920, present.

AFRICA.

Countries in which plague was reported: Algeria, British East Africa, Egypt, Senegal, and Union of South Africa.

Algeria.—Algiers, October, 1919, 2 cases.

British East Africa.—Kisumu, June 29 to July 26, 1919, present; September 28 to November 1, 1919, 6 cases; December 14 to 20, 1919, and February 15 to 21, 1920, present in vicinity; April 25 to June 26, 1920, 14 cases. Mombasa, February to June, 1920, 108 cases. Nairobi, August 17 to 23, 1919, 5 cases; March 21 to 27, 1920, 2 cases; April 25 to June 19, 1920, 16 cases.

Egypt.—January 1 to December 25, 1919, 867 cases, 469 deaths; January 1 to June 30, 1920, 303 cases, 174 deaths. Occurrence of plague was reported in the Provinces of Assiout, Assouan, Beni-Souef, Fayoum, Girgeh, Keneh, Menoufia, and Minieh. Occurrence in cities: Alexandria, July 23 to December 3, 1919, 13 cases; February, 1920, 1 case; present in June, 1920. Ismailia, July 29, 1919, 2 cases; Kantarah, July 31 to August 3, 1919, 2 cases. Port Said, July 2 to October 27, 1919, 27 cases; February 13, 1 case. Suez, November, 1919, 2 cases; February to April, 1920, 30 cases; May 13 to June 8, 12 cases.

Senegal.—Dakar, September and November, 1919, 29 fatal cases.

Union of South Africa.—Hoopstad District, Orange Free State, 8 cases among natives on a farm.

SOUTH AMERICA.

Countries in which plague was reported: Argentina, Brazil, Chile, Ecuador, and Peru.

Argentina.—Rosario, December, 1919, 7 fatal cases; March, 1920, 2 fatal cases.

Brazil.—Bahia, November, 1919, 1 case; January 25 to May 11, 1920, 28 cases. Ceara, August and September, 1919, 84 cases. Pernambuco, in May, 1920, 1 case. Porto Alegre, 1 fatal case in September, 1919, and in November, 1919, 3 fatal cases. Rio de Janeiro, November and December, 1919, 9 cases; January, 1920, 1 case.

Chile.—Antofagasta, August, 1919, 3 cases; December, 1919, 1 case; February, 1920, 1 case; May and June, 1920, 5 cases.

Ecuador.—Guayaquil, November, 1919, 2 cases; January to April, 1920, 45 cases.

Peru.—Callao, November, 1919, 3 fatal cases; Salaverry and Trujillo, July to December, 1919, 23 cases; December 29, 1919, to April 25, 1920, 61 cases. In March, 1920, 46 cases, and in April, 1920, 36 cases, were reported in Peru occurring in coastal cities and departments.

MEXICO.

Tampico.—June 14, 1920, 1 case; June 25, 1920, 1 case.

Vera Cruz.—April 25 to June 13, 1920, 30 cases; June 14 to 20, 1920, 11 cases.

INSULAR.

Azores.—Fayal and Terceira Islands, present in September, 1919.

Hawaii.—Ah Poi Camp, July, 1919, 1 case; Koloha, February 23, 1920, 1 case; Kukuiaua, September 23, 1919, 3 cases; Paauhau, July, 1919, 1 case; Paauilo, September 25, 1919, 2 cases.

ON VESSELS.

Steamship "Alps Maru."—February 28 to March 5, 1920, at port of London, 2 cases. The vessel left Yokohama December 3, 1919, and Suez, January 21, 1920.

Steamship "Clan Lamont."—August 19, 1919, 1 case in dock at London, England. The *Clan Lamont* left Calcutta March 23, 1919, arriving May 9 at Buenos Aires, Argentina, sailing thence June 20; arriving at Montevideo and sailing thence June 21; arriving at St. Vincent, Cape Verde Islands, July 10, 1919.

Steamship "Espana."—Reported quarantined at Las Palmas, Canary Islands, March 22, 1920, for plague, which occurred on board en route. The vessel left Buenos Aires, Argentina, February 16; arrived at Malaga, Spain, March 16. Destination, Mahon, Island of Minorca.

Steamship "Framlington Court."—July 25, 1919, 1 case. The vessel arrived at Avonmouth, England, July 22, 1919. The itinerary of the vessel showed departure from Alexandria, Egypt, May 30; from Montreal and Sydney, Canada, July 4 and 8, respectively.

Steamship "Kaiser-i-Hind."—November 28, 1919, 3 cases at Port Said, Egypt. The vessel left Bombay, November 15, for London.

Steamship "Nagoya."—October 21 to 27, 1919, 6 cases. The vessel left Yokohama, Japan, August 30, the ports of call being Kobe, Shanghai, Hongkong, Penang, Singapore, and Colombo, in Asia; in Egypt, Port Said; in Europe, Marseille, Gibraltar, and Plymouth.

Steamship "Nankin."—From July 10 to 17, 1919, 17 cases. The vessel arrived July 12 at Port Said. At sea, July 10 to 12, 9 cases; landed at Port Said, 17 cases. The vessel left London for Marseille; original port of departure, Bombay, May 3, 1919.

Steamship "Rashid Pacha."—December 3, 1919, at Alexandria, Egypt, from Constantinople, Saloniki, and Smyrna, 1 fatal case.

RAT EXAMINATION AND PLAGUE IN RODENTS.

Reports of the actual numbers of rats examined and found infected are available only for Hongkong and Shanghai, China; Liverpool, Great Britain; Hawaii; and the Philippine Islands.

China.—Hongkong, July to December, 1919, rats examined, 52,515; found infected, 63. January to March, 1920, rats examined, 11,270, found infected, 1; 14-week period ended June 5, 1920, 31,053 rats examined, 1 rat, found during the week ended June 5, was found infected; June 6 to 26, 1920, rats examined, 6,424; found infected, 4 rats. Shanghai: During the period, July 1 to December 31, 1919, rat examination was conducted at Shanghai, but reports giving data were not received. From January to June, 1920, 4,872 rats were examined. No plague infection was reported found.

Great Britain.—Liverpool, August 9 to December 27, 1919, 3,114 rats examined. During the two weeks ended October 18, 1919, several plague-infected rats were found on the steamship *Musician*, from South American ports. January to June, 1920, 4,331 rats were examined; no plague infection found.

Hawaii.—Rat examination continued to be reported, with an average of about 400 rats examined per week at Honolulu and about 1,200 at Hilo. The finding of plague rats was reported as follows: Kukaiau, four weeks ended September 27, 1919, 16 rats; January

17, 1920, 1 rat. Paauhau, July 2, 1919, 2 rats. Paauilo, August 29, 1919, 1 rat; October 4, 1919, 1 rat. Ookala, January 30, 1920, 1 rat.

Philippine Islands.—July to December, 1919, 47,588 rats examined; January to June, 1920, 43,207 rats examined. No plague infection found.

TYPHUS FEVER.

EUROPE.

Countries in which typhus fever was reported: Austria, Belgium, Bulgaria, Czechoslovakia, Danzig, Finland, Germany, Great Britain, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Roumania, Russia, Serbia, Spain, and Turkey.

Austria.—July 13 to August 16, 1919, 27 cases; September 7, 1919, to February 6, 1920, 65 cases. Vienna, August and September, 1919, 3 cases; January 4 to March 15, 1920, 24 cases.

Belgium.—Ghent, January, 1920, 2 fatal cases.

Bulgaria.—Sofia, December, 1919, 2 cases; January to May, 1920, 29 cases, and in June, 1920, 2 cases; Varna, February, 1920, 110 cases; Vratza and vicinity, January, 1920, present.

Czechoslovakia.—Leipnik, quarantine station, February, 1920, 1 case; Prague, December, 1919; 1 case; January 4 to February 7, 1920, 225 cases.

Danzig.—April and May, 1920, 2 cases; June, 1920, 1 case.

Finland.—Helsingfors, September to November, 1919, 2 cases; Province of Viborg, July, 1919, 2 cases.

Germany.—August 3 to October 4, 1919, 100 cases, 36 among civil population, remainder among troops and prisoners of war; October 5 to December 6, 1919, 10 cases; December 7, 1919, to January 17, 1920, 73 cases—in civil population 28, German troops 45; February 22 to March 27, 1920, 23 cases, including 2 from Poland.

Great Britain.—Belfast, December 28, 1919, to May 22, 1920, 4 cases; Dublin, August, 1919, 3 cases; April 25 to June 19, 1920, 11 cases; Dundee, June 30 to July 5, 1919, 3 cases; Glasgow, June to December, 1919, 15 cases; and May 30 to June 5, 1920, 1 fatal case.

Greece.—Athens, July 21 to October 6, 1919, 2 fatal cases; Drama, November and December, 1919, 6 cases; Kavala, November and December, 1919, 4 cases; Saloniki, July to December, 1919, 61 fatal cases; and December 28, 1919, to June 27, 1920, 584 cases; Thassos Island, December 22, 1919, 1 case; Zihna, 1 case.

Hungary.—August 25 to December 7, 1919, 36 cases, and December 18, 1919, to January 18, 1920, 49 cases; Budapest, June 30 to July 13, 1919, 34 cases; and December 18, 1919, to January 18, 1920, 19 cases.

Italy.—July 6 to September 21, 1919, 33 cases occurring in a number of Provinces among the civil population, military, and prisoners of war. Urban cases: Brindisi, December, 1919, 1 case; Genoa, June 25 to July 1, 1919, 91 cases; Naples, June 30 to August 17, 1919, 17 cases; and January, 1920, 91 cases; Palermo, July, 1919, 2 cases; Trieste, December 14 to 27, 1919, 3 cases, and December 28, 1919, to May 15, 1920, 19 cases; Venice, June to December, 1919, 56 cases.

Netherlands.—Rotterdam, October, 1919, 1 case.

Poland.—November 1 to 30, 1919, 11,264 cases, with 942 fatalities; January 1 to March 31, 1920, 87,910 cases, with 19,733 fatalities.

Warsaw, November 1 to 30, 1919, 107 cases, and January 1 to February 29, 1920, 911 cases.

Portugal.—Lisbon, July 26 to December 12, 1919, 13 cases; Oporto, June 30 to December 27, 1919, 83 cases.

Russia.—Riga, July, 1919, 1,247 cases; February, 1920, about 2,500 cases each in Narva and Reval, Provinces of Esthonia, and on February 16, 1920, an estimated number of 8,000 cases reported in the Province of Esthonia. In March, present in Black Sea ports.

Serbia.—March 14 to April 10, 1920, 181 cases.

Spain.—Barcelona, November, 1919, 7 cases; Bilbao, December, 1919, 1 fatal case; Corunna, November and December, 1919, 2 cases; Madrid, August and September, 1919, present, and February to April, 1920, 3 fatal cases.

Switzerland.—Zurich, September, 1919, 9 cases.

Turkey.—Constantinople, November 14 to December 27, 1919, 49 cases; February 8 to May 1, 1920, 160 cases; Princes Islands, February 8 to May 1, 1920, 50 cases; Samsoun, February and March, 1920, 15 cases, and April 11 to May 2, 1920, 2 cases.

ASIA.

Countries in which typhus fever was reported: China, Chosen (Korea), India, Japan, Mesopotamia, Siberia, and Syria.

China.—Antung, July 6 to December 14, 1919, 6 cases; Tientsin, February 1 to 7, 1920, 1 case.

Chosen (Korea).—July 1 to 31, 1919: Chemulpo, 1 case; Fusan, 1 case; Seoul, 1 case. March 1 to April 30, 1920, Seoul, 4 cases.

India.—Rangoon, July, 1919, 21 fatal cases.

Japan.—Nagasaki, July 14 to December 28, 1919, 23 cases; January 12 to March 28, 1920, 6 cases; May 25 to June 27, 1920, 2 cases.

Mesopotamia.—Bagdad, July 26 to August 15, 1919, 3 cases.

Siberia.—Vladivostok, July 1 to December 15, 1919, 458 cases; January 1 to 31, 1920, 279 cases.

Syria.—Smyrna, September, 1919, present.

AFRICA.

Countries in which typhus fever was reported: Algeria, Egypt, Tunis, and the Union of South Africa.

Algeria.—Department of Algiers, July to December, 1919, 6 cases; January 1 to June 30, 1920, 49 cases; Algiers City, January to June, 1920, 12 cases. Department of Constantine, November and December, 1919, 2 cases; January to June, 1920, 56 cases. Department of Oran, November and December, 1919, 6 cases; January to June, 1920, 647 cases. South Territories, March, 1920, 43 cases.

Egypt.—Alexandria, June 28 to December 16, 1919, 491 cases, with 159 deaths, and January 1 to June 24, 1920, 725 cases, with 183 fatalities. Cairo, January to September, 1919, 4,192 cases, with 2,320 fatalities; October to December, 1919, 113 cases, with 46 fatalities; January 15 to May 6, 1920, 762 cases, with 294 fatalities. Port Said, July 16 to December 16, 1919, 1 fatal case; April 1 to May 6, 1920, 1 fatal case.

Tunis.—July 20 to December 20, 1919, 6 cases, and December 29, 1919, to May 15, 1920, 25 cases.

SOUTH AMERICA.

Countries in which typhus fever was reported: Bolivia, Brazil, Chile, Colombia, Paraguay, and Peru.

Bolivia.—La Paz, June 29 to December 20, 1919, 30 cases; January 4 to May 31, 1920, 38 cases.

Brazil.—Ceara, January 4 to 10, 1920; 1 case; March 28 to April 3, 1920, 2 fatal cases; April 25 to May 1, 1920, 2 fatal cases. Porto Alegre, February 1 to 7, 1920, 1 fatal case. Rio de Janeiro, July 6 to September 20, 1919, 9 cases.

Chile.—Antofagasta, October 20 to December 14, 1919, 32 cases. Caleta Coloso, May 10 to 16, 1920, 2 fatal cases. Concepcion, March 8 to June 19, 1920, 37 fatal cases. Coquimbo, March 2 to 16, 1920, 2 fatal cases. Santiago, November 1 to 11, 1919, 397 cases. Valparaiso, October 12 to December 27, 1919, 1,232 cases; December 28, 1919, to May 1, 1920, 243 cases; May 2 to June 12, 1920, 21 fatal cases. The outbreak of typhus in Chile was stated to have originated in October, 1918. During the month of January, 1920, 939 cases of typhus fever, with 203 fatalities, occurring in 12 Departments, were notified; month of February, 1920, 495 cases, with 109 fatalities, occurring in 18 cities; March, 1920, 409 cases, 72 fatalities; April, 1920, 298 cases, with 49 fatalities; May, 1920, 312 cases, 50 fatalities; June, 1920, 419 cases, 73 fatalities.

Colombia.—Barranquilla, July 12 to 19, 1919, 1 fatal case.

Paraguay.—Asuncion, November 30 to December 6, 1919, 1 case.

Peru.—Callao, November 1 to 30, 1919, 1 fatal case; January 1 to February 29, 1920, 2 cases. Cerro de Pasco, December 7 to 13, 1919, 1 case. Salaverry and Trujillo, January 1 to 7, 1920, 1 case.

MEXICO.

Localities in which typhus fever was reported:

Chihuahua.—November and December, 1919, 3 cases; January 11 to June 6, 2 cases, with 1 fatality.

Guadalajara.—September, 1919, 3 cases.

Mexico City.—June 29 to December 27, 1919, 588 cases; December 28, 1919, to February 28, 1920, 188 cases.

Saltillo.—November, 1919, 2 cases; March, 1920, 1 case.

San Luis Potosi.—Present from July to December, 1919, and January to June, 1920.

NORTH AMERICA.

Canada.—December, 1919, 1 case in Ontario Province.

YELLOW FEVER.

CENTRAL AMERICA.

Countries in which yellow fever was reported: Canal Zone, Colombia, Honduras, Nicaragua, and Salvador.

Canal Zone.—At quarantine, 1 case, August, 1919.

Colombia.—Buenaventura, June, 1920, 1 fatal case.

Honduras.—Amapala, August and September, 1919, 9 cases.

Nicaragua.—Chinandega, present in October, 1919, and Leon, September and October, 1919; Managua, November, 1919, present, with 1 reported case.

Salvador.—Armenia, June, 1920, 1 case; La Union, July, 1919, 2 cases; San Miguel, June 24 to July 6, 1919, 4 cases; Salvador, June 24 to July 6, 1919, 1 case; Sonsonate, May 22 to June 24, 1920, 49 cases.

MEXICO.

Localities in which yellow fever was reported:

Campeche.—December, 1919, 1 case.

Merida.—June 30 to December 27, 1919, 47 cases; December 28 to March 20, 1920, 2 cases. Of the cases reported during the first-named period 4 cases were brought from Temax and several from Muna.

Vera Cruz.—June 22, 1920, 2 fatal cases.

SOUTH AMERICA.

Countries in which yellow fever was reported: Brazil and Peru.

Brazil.—July, 1919, seriously prevalent in States of Bahia and Pernambuco; City of Bahia, July 6 to November 8, 1919, 27 cases; February 29 to April 17, 1920, 2 cases; May 23 to June 19, 1920, 1 case. Pernambuco, 1 case in September, 1919. Santos, August, 1919, 1 fatal case.

Peru.—Department of Paita, July and August, 1919, 11 cases; Piura department, July, 1919, 46 cases; present in September, 1919. From March 1 to 31, 1920, 128 cases, and April 1 to 30, 1920, with 64 cases, including 1 case at Callao from steamship *Huallaga*.

ON VESSELS.

Steamship *Huallaga*, at quarantine, Callao, Peru, April, 1920, 1 case.

Steamship *Salvador*, at quarantine, Canal Zone, Panama, August 4, 1919, 1 case. Patient embarked at Corinto, Nicaragua.

DIVISION OF MARINE HOSPITALS AND RELIEF.

The increase in activities of this division and its tremendous expansion was foreshadowed in my last annual report. This division for the time being, at least, has become the largest division of the Public Health Service, and the expansion in its work has not yet ceased. This very large increase in the responsibility and work of this division, as reported, is entailed by the provisions of Public Act 326 of the Sixty-fifth Congress, which has, in effect, authorized the Public Health Service "to provide immediate additional hospital and sanatorium facilities for the care and treatment of discharged sick and disabled soldiers, sailors, and marines, Army and Navy nurses (male and female), patients of the War Risk Insurance Bureau," in addition to those persons who are already beneficiaries of the service.

PRESENT STATUS.

Under the provisions of the legislation mentioned, the Public Health Service became in essence an agency through which the Director of the War Risk Insurance Bureau might obtain medical care and treatment for his beneficiaries, although sick and disabled discharged soldiers, sailors, etc., are made beneficiaries of the Public Health Service. The legislation as passed in the acts creating the War Risk Insurance Bureau, the Federal Board for Vocational Education, and Public Act 326, necessitated cooperative adjustments of a very broad nature between these three agencies. Most of these adjustments have now been made, and although at first delays were frequent by reason of the necessity for establishing such adjustments, these delays have gradually grown less, as the necessary adjustments have been perfected. The work of the Public Health Service in cooperation with these two bureaus has gained in efficiency along with experience, and it is hoped that this efficiency may be steadily increased as the administrative arrangements between these bureaus is better perfected.

In the organization of any matter of such magnitude there are, of course, uncertainties of many kinds. Such uncertainties, unfortunately, are by no means conducive to the best results. This has been felt most keenly in the matter of securing adequate professional personnel to meet so large a responsibility. This, of course, is a more or less natural outcome of any such situation, but is none the less embarrassing.

Medical officers, nurses, dietitians, reconstruction aides, and other professional personnel are very unwilling to remain with the Public Health Service, or with any other agency, unless they can rest upon some status more permanent than is now possible under existing law and administrative arrangements. Opportunities for professional personnel are large in civil life and elsewhere at the present time, and the Public Health Service has lost many competent persons by

reason of the indefiniteness of the present situation. Nothing would do more to stabilize the personnel of the service and enable it to secure competent persons in sufficient numbers for the performance of this work, than to fix definitely the responsibility of the service and place all such personnel on a permanent basis.

COOPERATION WITH OTHER BUREAUS.

In addition to the adjustments that necessarily have had to be made with the War Risk Insurance Bureau, the Public Health Service, on the other hand, has had to make adjustments with the Federal Board for Vocational Education, and also, to some extent, with the Medical Departments of the Army and Navy and with other agencies interested in or involved in the care of ex-service men and women.

These problems have in large measure been fairly well settled by the fact that the Director of the War Risk Insurance Bureau has really made use of the Public Health Service as the medical agency through which he has obtained medical advice and medical care and treatment for his beneficiaries, and the Federal Board for Vocational Education has taken the same attitude. The result is that during this fiscal year all of the medical activities relating to ex-service men and women have practically been under the control of the Public Health Service and administered by this division. The chief medical adviser of the Bureau of War Risk Insurance is an officer of the United States Public Health Service and all of his subordinates are officers of this service. Moreover, the medical personnel used by the Federal Board for Vocational Education is also composed of officers of the Public Health Service, and all of these agencies for their field activities have operated through the offices of the district supervisors, which were created by the Public Health Service and are maintained by that service.

In this connection should be mentioned the cooperation which has been extended the Public Health Service during the past fiscal year by the American Red Cross. This organization has discharged the functions of a medical social service for sick and disabled ex-service men and women undergoing treatment in the hospitals of the Public Health Service. This has necessitated quite an extensive organization and the work has been done with sympathy and with satisfaction. The Public Health Service, and this division particularly, feels that this acknowledgment should be made to the American Red Cross at this time for its hearty cooperation and excellent support not only in this particular matter but in many other matters connected with this very important work.

ORGANIZATION.

CENTRAL OFFICE.

In the expansion of its work, the Hospital Division has been entirely reorganized on a very much larger scale and has found no little difficulty in securing office space adequate to its needs. This has necessitated three distinct moves in order to secure sufficient space. At the present time it is believed that this problem has been settled

by moving into one of the temporary buildings constructed during the war, which is situated at Seventh and B Streets SW., and in this building there has been secured a floor area which, it is believed, will be sufficient to meet the needs of this division, certainly for some time to come.

There are now organized in this division 14 sections, as follows: Executive, personnel, financial (maintenance and accounts, contract relief), reconstruction, statistical, district supervision, dental, laboratory and X ray, neuropsychiatric, tuberculosis, nursing, dietetic, construction, out-patient relief.

These sections, as their names indicate, are each independent units devoted to the care of the different features of the work and operating under the chief of the division and coordinated through an executive staff. The activities of these various sections are detailed below, and statistics of the work performed by them will be found later in this report.

FIELD ACTIVITIES.

In addition to the expansion of the central office this division has been very earnestly engaged in a similar expansion of its field activities. Besides the increase in the number of its hospitals and the expansion in the bed capacity of the same, as reported last year, it was found desirable and necessary to create new field administrative agencies, and to decentralize certain important administrative functions in order that contact in the field might be promptly made with ex-service men and women seeking medical care and treatment. This problem was met by the creation and development of the offices of the district supervisors, the United States being divided into 14 districts, which districts were coincident with districts of other governmental agencies, notably the Federal Board for Vocational Education and, in part, the Bureau of War Risk Insurance. The offices of the district supervisors from very simple beginnings, made in a tentative way, have, during the year, grown enormously, and perform highly useful functions. In fact, these agencies have formed really the only means by which the Public Health Service, and to a large extent, the War Risk Insurance Bureau have been enabled to get into close touch with ex-service men and women in the field, to secure for them those services which the law evidently intended they should have.

These offices have during the past year, as statistics will show, rendered an enormous service in assisting ex-service men and women properly to make their claims upon the War Risk Insurance Bureau, in making medical examinations of all such claimants, and in hospitalizing or furnishing dispensary care to those who were in need of the same. They have also rendered similar services for the Federal Board for Vocational Education, and in connection with the American Red Cross and other agencies have enabled the Public Health Service to remain in close contact with all of its field activities. One of the greatest difficulties in the maintenance of these offices has been to keep pace with their rapid growth and to secure for them under present economic conditions adequate office space. They have

grown so rapidly that it has been difficult to find the space necessary, especially since, after conference with the War Risk Insurance Bureau and the Federal Board for Vocational Education, the very wise policy was adopted of attempting to house under one roof the local offices of these three agencies, along with that of the American Red Cross, which has been doing medical social service work along with all agencies involved in the care of ex-service men and women. Notwithstanding these difficulties, success has been attained in this matter almost over the entire United States, and most of these offices are now operating under one roof with the other agencies involved, with the result that ex-service men and women obtain a far more adequate and far more prompt service than could ever be achieved in any other manner. This has involved the expenditure of considerable money, but the service rendered is believed to be well worth the expenditure.

Moreover, in the development of these district offices the attempt has been made, and is now being made, to place directly with these offices, or very near by, the medical agencies necessary to render outpatient care and treatment and to furnish to all beneficiaries of the War Risk Insurance and of the Federal Board for Vocational Education the necessary medical examinations, including highly specialized services, such as X-ray, dental treatment, prosthetic apparatus, and other similar things. This program is still being developed and is meeting a very real and important need, which it is believed will be even more important in the future than it is at the present time.

The location and extent of these districts are shown on the map herewith attached,¹⁹ and the headquarters of each district is placed in some large center of population, as follows:

District. Headquarters.

- No. 1. Boston, Mass.
- No. 2. New York City.
- No. 3. Philadelphia, Pa.
- No. 4. Washington, D. C.
- No. 5. Atlanta, Ga.
- No. 6. New Orleans, La.
- No. 7. Cincinnati, Ohio.

District. Headquarters.

- No. 8. Chicago, Ill.
- No. 9. St. Louis, Mo.
- No. 10. Minneapolis, Minn.
- No. 11. Denver, Colo.
- No. 12. San Francisco, Calif.
- No. 13. Seattle, Wash.
- No. 14. Dallas, Tex.

HOSPITALS.

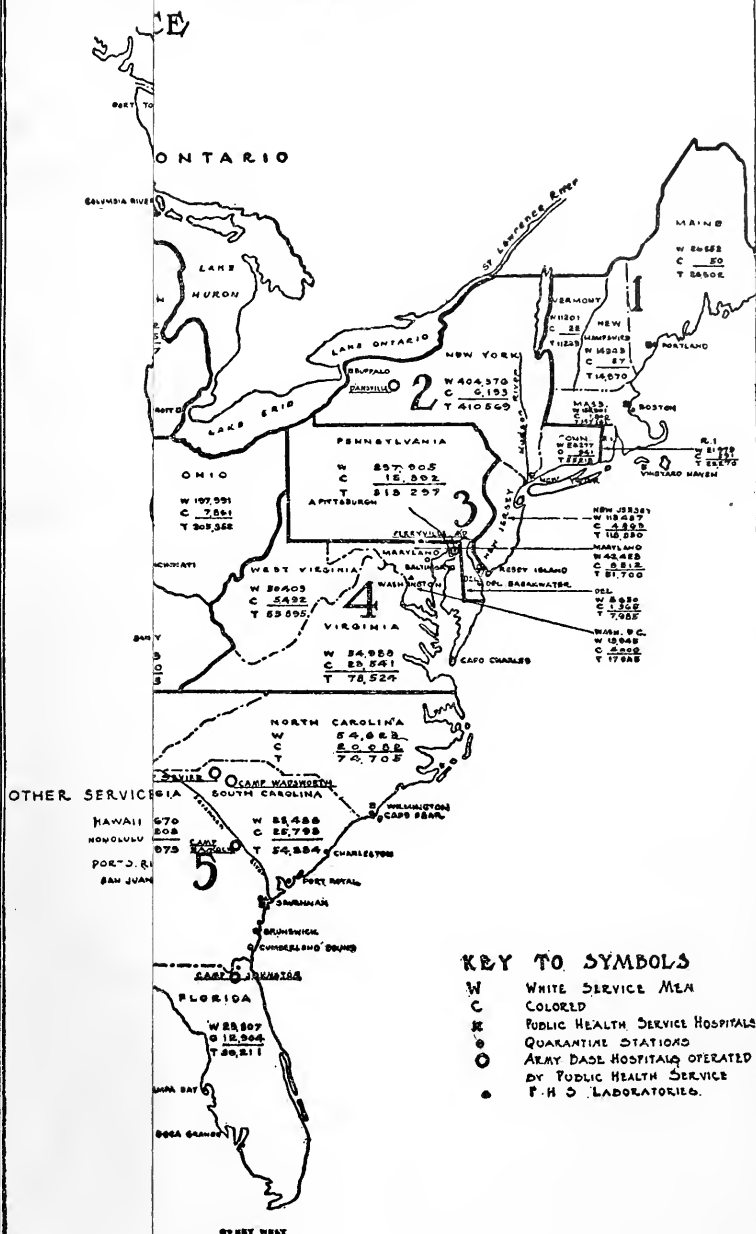
This division at the time of the passage of public act 326 was operating some 22 marine hospitals with a total bed capacity of about 1,500. This has now been increased to over 50 hospitals in operation with a total bed capacity of upward of 12,500, and this increase is still going on. It is estimated that the Public Health Service will have within the next three or four months from 3,000 to 4,000 additional beds.

The Public Health Service hospitals maintained and operated at the present time by the service are shown in the list given below. The marine hospitals of the service are operated as previously, with the exception of three, which at the present time are temporarily closed, namely, Cairo, Ill., Wilmington, N. C., and Baltimore, Md.

¹⁹ See map facing this page.

ALASKA
W 8,100
C 1,100
T 9,200

IONS OF WORK



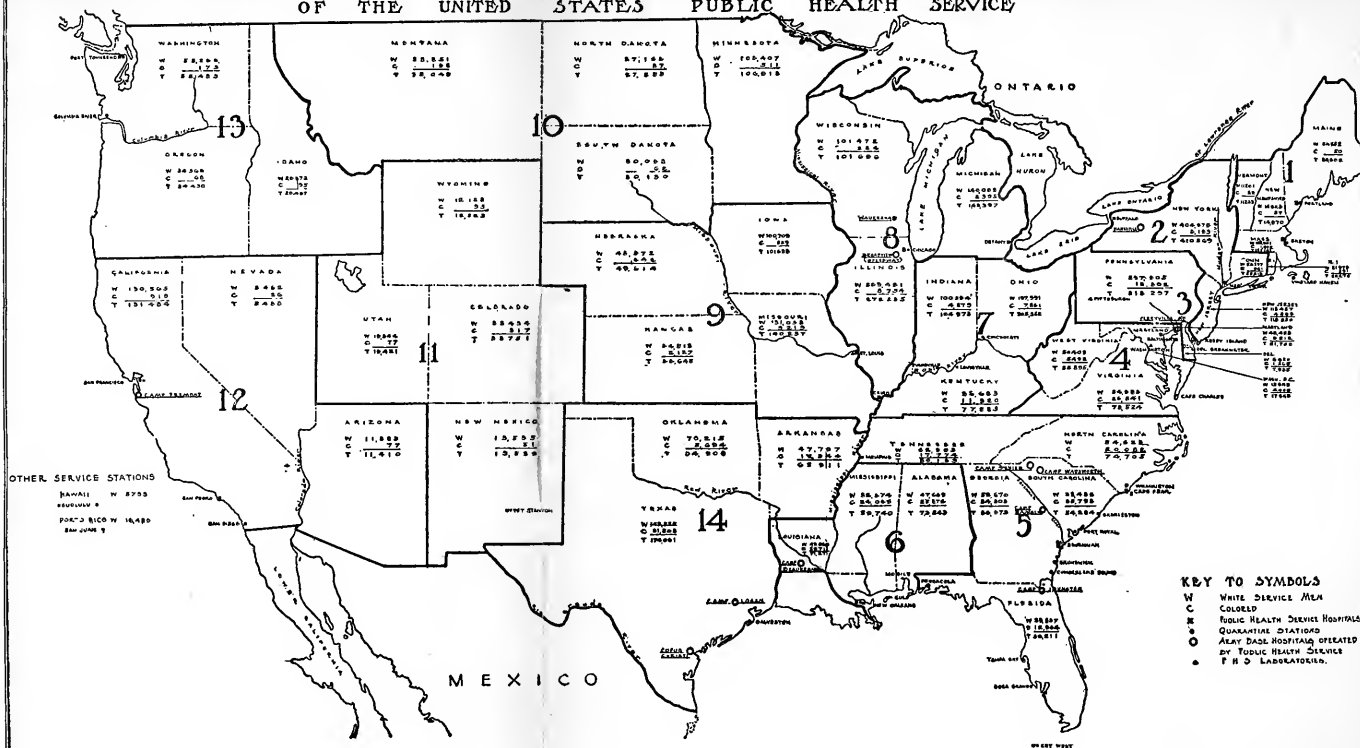
KEY TO SYMBOLS

- W WHITE SERVICE MEN
- C COLORED
- PUBLIC HEALTH SERVICE HOSPITALS
- QUARANTINE STATIONS
- ARMY DASH HOSPITALS OPERATED BY PUBLIC HEALTH SERVICE
- P.H.S. LABORATORIES

P.H.S. 27

MAP OF THE UNITED STATES SHOWING LOCATIONS OF DISTRICTS FOR SUPERVISION OF WAR RISK WORK OF THE UNITED STATES PUBLIC HEALTH SERVICE

ALASKA
W 8,100
C 1,100
T 1,100



It is expected that these particular hospitals will be later opened after being remodeled, repaired, and placed in better condition to meet the demands of the situation.

Public Health Service hospitals.

- No. 24. Palo Alto, Calif. (general).
- No. 25. Houston, Tex. (general).
- No. 26. Greenville, S. C. (tuberculosis).
- No. 27. Alexandria, La. (general).
- No. 29. Norfolk, Va. (general).
- No. 30. Chicago, Ill. (general).
- No. 32. Washington, D. C. (general).
- No. 34. East Norfolk, Mass. (neuro-psychiatric).
- No. 35. St. Louis, Mo. (general).
- No. 36. Boston, Mass.—Parker Hill (general).
- No. 37. Waukesha, Wis. (neuro-psychiatric).
- No. 38. New York City, 345 West Fifth Street (general).
- No. 41. New Haven, Conn. (tuberculosis).
- No. 42. Perryville, Md. (neuro-psychiatric).
- No. 43. Ellis Island, N. Y. (general).
- No. 44. West Roxbury, Mass. (neuro-psychiatric).
- No. 45. Biltmore, N. C. (general).
- No. 48. Atlanta, Ga. (general).
- No. 49. Philadelphia, Pa. (neuro-psychiatric).
- No. 50. Prescott, Ariz. (tuberculosis).
- No. 52. Boise, Idaho (general).
- No. 53. Dwight, Ill. (general).
- No. 54. Arrowhead Springs, Calif. (general).
- No. 55. Fort Bayard, N. Mex. (tuberculosis).
- No. 56. Fort McHenry, Baltimore, Md. (general).
- No. 57. Knoxville, Iowa (neuro-psychiatric).
- No. 58. New Orleans, La. (neuro-psychiatric).
- No. 59. Tacoma, Wash. (tuberculosis).

The question of supplying hospital facilities for patients of the War Risk Insurance Bureau has been difficult in a great many respects. The demand for hospital facilities has been very heavy and the situation has constituted a real emergency. In order to meet this emergency the Public Health Service has expanded what facilities it had so far as appropriations would permit and has secured additional facilities as rapidly as possible, either by transfers from the Army or Navy or by the lease of buildings, which could be made at least temporarily satisfactory for this purpose by alterations and remodeling. The whole problem has been one of difficulty by reason of the fact that the number of patients could not be determined with any accuracy. This has necessitated on the part of the Public Health Service a program on somewhat of an adjustable scale; that is to say, that the Public Health Service has been compelled more than once to do things which could not always be adequately justified from an economic standpoint, but which were absolutely necessary to meet the very urgent demands for the care of sick and disabled ex-service men and women. The situation has necessitated the tentative opening of some hospitals which subsequently had to be closed, and the acquirement of facilities which were known to be unsatisfactory for the purposes to which they were put, but which could not be replaced in the emergency by any better facilities at this particular time. This necessary attitude of adjustability to meet a situation whose magnitude was not definitely known, and to supply facilities in the

various parts of the United States, has not infrequently required the expenditure of considerable money which under plans better matured might have been avoided. Unfortunately, the time for maturing such plans was an element which was lacking.

MAGNITUDE OF PROBLEM AND FUTURE PLANS.

When this responsibility was first thrown upon the Public Health Service a great deal of time and effort was devoted to the very important question of attempting to determine the magnitude of the problem involved and of estimating as accurately as possible the number of people whom it would be necessary to hospitalize. The chief medical adviser of the Bureau of War Risk Insurance also devoted himself to this question. As a result there was compiled and presented to Congress by the Secretary of the Treasury Public Document No. 481 of the Sixty-sixth Congress, which outlined so far as information could be obtained the general features of the situation and gave as close an estimate as possible of what the demands would be.

The Public Health Service felt, and still feels, that it would be wise for the National Government to undertake the construction of proper hospital facilities for the care of ex-service men and women, so that demands could be met for the various types of cases all over the United States. The Public Health Service realized that, pending such construction, a temporary program of some character was a necessity and adopted the policy at once of securing such temporary facilities as could be secured, with the express intention of abandoning these facilities as promptly as they could be replaced by better.

In Public Document No. 481, previously referred to, an analysis was made of prospective patients according to three groups, namely, neuro-psychiatric, tuberculous, and general medical and surgical. After carefully reviewing all available data, it was estimated in this document that the needs for hospital beds within two years would be as follows: Neuro-psychiatric patients, 11,000; tuberculous patients, 12,000; general medical and surgical, 7,200.

The experience, both of this division and of the medical department of the War Risk Insurance Bureau, subsequent to this time has to a large extent confirmed the estimates made, and if the demands continue at their present rate it is believed that this estimate will prove to have been not excessive.

Basing itself upon figures of the chief medical adviser of the Bureau of War Risk Insurance, the Public Health Service presented to Congress a comprehensive plan of hospital construction to meet the needs of ex-service men and women and the Secretary approved of this plan. It contemplated an ultimate expenditure of something like \$85,000,000. The entire matter was discussed for many weeks before the Committee on Buildings and Grounds of the House of Representatives. At the request of this committee, the Public Health Service prepared a second program of an urgent nature, contemplating the expenditure of about \$30,000,000 for hospital construction, and bills were introduced in the Senate and the House both to

meet this program, but did not receive any action before Congress adjourned.

In the discussion of the entire subject before this committee, as well as on the floor of the House, the question of making use of other governmental agencies, particularly hospitals of the Army and the Navy, and also of the National Homes for Disabled Volunteer Soldiers, received a great deal of attention. It seemed under the circumstances that Members of Congress felt it would be more economical and equally as satisfactory to make use of these Government agencies rather than go into a program of hospital construction on a large scale. Doubtless this policy will prevail for a while. The Public Health Service feels, however, that in order adequately to meet this problem there will necessarily have to be new construction on a rather extensive scale by the National Government, especially for patients suffering from tuberculosis and mental disorders of various kinds. The general medical and surgical cases can probably be met by temporary measures, but the other two types of cases are different and require very much longer terms of treatment, and there is on the part of these beneficiaries of the Government a strong disinclination to be cared for in other than Government hospitals.

The hospitals of the Army and Navy are only temporarily available, because their facilities are being reduced, and will in a few months be adequate only for the care of their own personnel. The development of the National Homes for Disabled Volunteer Soldiers as hospitals is an experimental thing which may or may not partially meet the needs of the situation. In this connection, it seems pertinent to suggest that the conversion of these beds into hospital beds is depriving the veterans of the World War of those facilities which they will necessarily need within a comparatively short space of time.

The details regarding the individual hospitals opened and closed during the year will be found later on in the report on hospital construction.

PURVEYING SERVICE.

The Purveying Depot, which in previous years has operated as part of the Hospital Division, has grown to such size that it was deemed better to establish it as an independent function, operating under the Surgeon General. Under the Purveying Service has also been placed, for reasons of practicability and economy, two other sections originally created in this division, namely, the section on property and the section on transportation. These three functions are very closely related, and are now operating under a medical purveyor, reporting directly to the Surgeon General, who is in close cooperation in all matters with this division.

GENERAL INSPECTION SERVICE.

There was created also in the Hospital Division during this fiscal year a section on inspection, which was found urgently necessary. It was realized in the beginning that this was not exactly logical, and with the development of the situation the inspection section became an independent agency operating under the Surgeon General.

Under the service regulations approved August 29, 1920, the Inspection Section became the General Inspection Service.

PERSONNEL OF HOSPITAL DIVISION.

It will be noticed in the detailed report which follows on each individual section that the personnel section of the Hospital Division has been omitted. This is owing to the fact that the personnel section of this division is in reality a part of the Personnel Division of the bureau, and the section in this division was established only to carry on the activities of the very large personnel which is assigned to the Hospital Division. These activities, however, are coordinated under the Personnel Division of the bureau and will form a part of that division's report. A similar statement might be made regarding one or two other activities of this division.

NEW REGULATIONS.

With the increased responsibility and work of the Hospital Division the preparation of new regulations as soon as possible became a matter of a great deal of importance. A great deal of time and effort has been expended during the year in the preparation of regulations for this division, and these regulations are expected shortly to appear in printed form. They will make many radical changes in the organization of this division as it existed previous to the assumption of the duties required by the new legislation. It is expected that they will appear in separate form from the general regulations of the service, and it is hoped that they may be issued at an early date and the reorganization outlined in them put into complete and permanent effect. A great deal of the matter in these regulations has, of course, already been put into effect through means of circular letters, but the final issue of the regulations will do much to stabilize matters and furnish a better working basis for all of the field activities of this division.

SUMMARY.

When due consideration is given to the many difficulties under which the work of this division has been performed during this past fiscal year and to the magnitude of the work involved and the results accomplished, it is believed that it may be fairly stated that the Hospital Division has undertaken an enormous task and has successfully carried on this work up to the present time. It is the earnest desire of this division that for the coming fiscal year this work may be done in a very much better and more satisfactory manner, and it is believed that with the consolidation of the new organization and the establishment of a better working basis that this may be readily accomplished. The work of the year may be briefly summarized in general terms in one paragraph:

During the fiscal year there have been cared for in hospitals about 87,000 patients of the War Risk Insurance Bureau, giving a total of nearly 3,400,000 hospital relief days. Also nearly 500,000 outpatient treatments have been furnished. A total of 350,000 medical

examinations have been made. Special services of various kinds have been arranged. For example, about 22,000 patients have been given dental treatment. At the present time over 2,000 patients are being given occupational therapy and over 3,000 physiotherapy each week. Prosthetic apparatus of various kinds have been furnished to thousands of patients.

This division, under the Surgeon General, as records show, has devoted itself with energy and sympathy to rendering whatever service was possible in the important work of rendering medical care and treatment to the men and women who have made sacrifices for the good of their country. The Public Health Service earnestly desires to do all that is possible to meet the just demands of these men and women, and realizes the grave responsibility involved and the magnitude of the work entailed. Should Congress deem it wise to continue this responsibility in any degree whatever, the Public Health Service stands ready heartily to accept the duty and will feel a pride in attempting to discharge this responsibility in a satisfactory manner.

The future development of the important work of caring for sick and disabled discharged soldiers and sailors of the World War will, of course, depend primarily upon the legislation which may be passed by Congress as to the responsibility of this important duty. The organization created and maintained by the Public Health Service for the medical care and treatment of ex-service men and women is now very large, and has been functioning for many months. This organization is believed to be adequate and suitable to meet the needs of the situation, and undoubtedly as time goes on this organization will become better perfected and even more suitable for this purpose.

The present somewhat indefinite legal status of the Public Health Service in this connection, together with the still further fact that the sundry civil bill, which becomes effective July 1, 1920, has shifted the jurisdiction of the appropriations previously given to the Public Health Service to that of the War Risk Insurance Bureau for the continuance of this work, it being provided that the War Risk Insurance Bureau shall make the necessary allotments to the Public Health Service for these expenditures, will require on the part of the Public Health Service a great deal of reorganization and readjustment of one kind or another, and makes the future of this work from the legal side still more indefinite and more unsatisfactory in many respects. As to just what effect it will have upon the organization can not now be said. This will depend upon future developments.

From all the records available, both from the War Risk Insurance Bureau and from this division, it would seem that the growth of this work will continue for some time to come. No one can say just when the peak of the load will be reached or fix at this time limitations upon the volume of work which will be required. Much will, of course, depend upon further legislation and upon the interpretation of existing legislation. At the present time the Hospital Division could not do otherwise than continue its expansion and prepare for even a greater volume of work, because its experience has demonstrated that the volume of work is steadily increasing

month by month, and, of course, the expenditures will keep pace therewith. Such will necessarily have to be the policy of the Hospital Division until there is some indication that the peak of the load is reached or passed and the work is declining.

RECOMMENDATIONS.

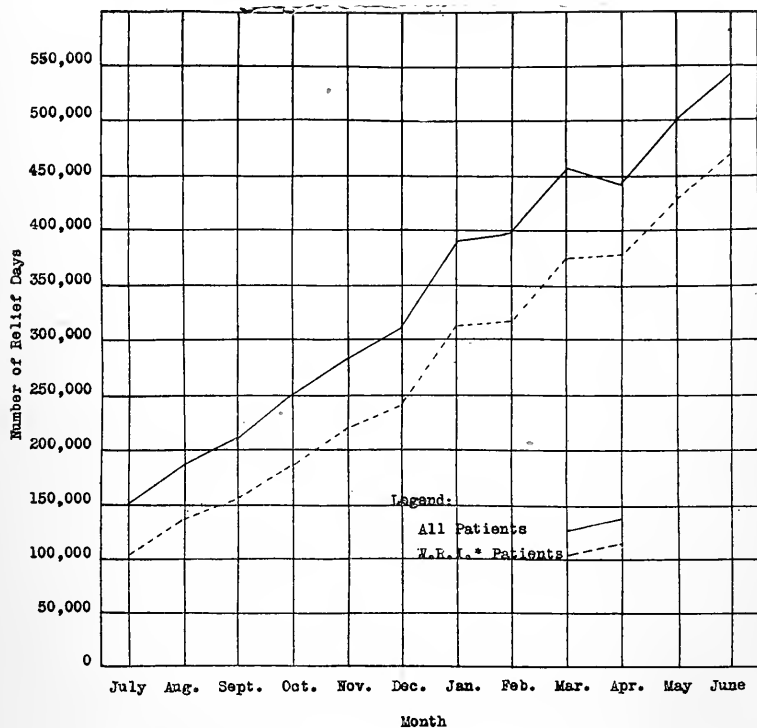
Numerous recommendations, all highly important, will be made as the work proceeds, but it is felt wise in this particular connection to make one or two recommendations regarding the broad general policies under which the work of this division must be conducted. It is not intended to cover anything except the highly important features of the situation. With this understanding, the following recommendations are made with regard to the continuance of this work:

It is believed of the utmost importance in the first place that the status of the Public Health Service in its war-risk work should be firmly established by placing an administrative head over the three major agencies involved, namely, the War Risk Insurance Bureau, the Federal Board for Vocational Education, and the Public Health Service, and that these three bureaus should operate thereunder as coordinate and independent bureaus in close cooperation. In the second place, it is believed equally important to define with clearness the authority and the responsibility of each of these bureaus and to delimit the functions of each. In the third place, the Public Health Service reiterates its firm belief that an adequate hospital construction program should be undertaken by the National Government for the care of ex-service men and women. It is not clear how this responsibility can be adequately met in any other way. Certainly consideration should be given to a program sufficiently adequate to meet the needs of the situation, and this will mean the expenditure of many millions of dollars. It is emphasized that the special needs to be met are those of ex-service men and women suffering from tuberculosis and mental disorders. These groups of patients will require treatment for longer periods of time, and their demand is for care and treatment in governmental institutions.

There follow reports of the individual sections engaged in this work, covering its several phases, with more detailed information, and there are also included in the report some charts giving graphic curves of certain data, which it is believed will prove of interest.

PLATE I.

Number of days relief furnished monthly at all stations of the Public Health Service, fiscal year 1920.

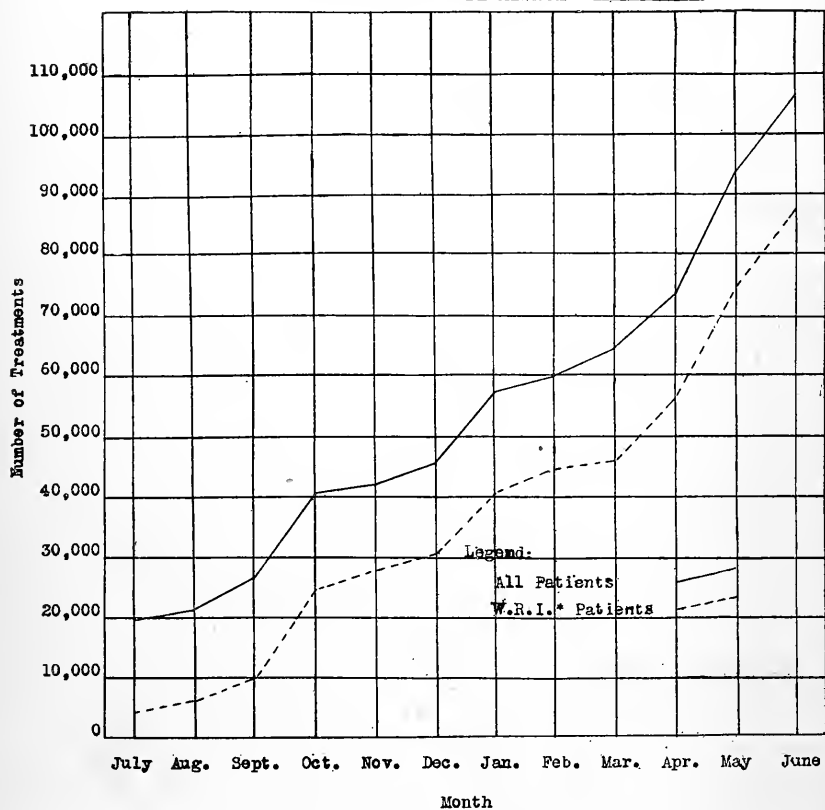


*War Risk Insurance.

NOTE: Curves are plotted from data as reported; no correction made for different lengths of months.

PLATE II.

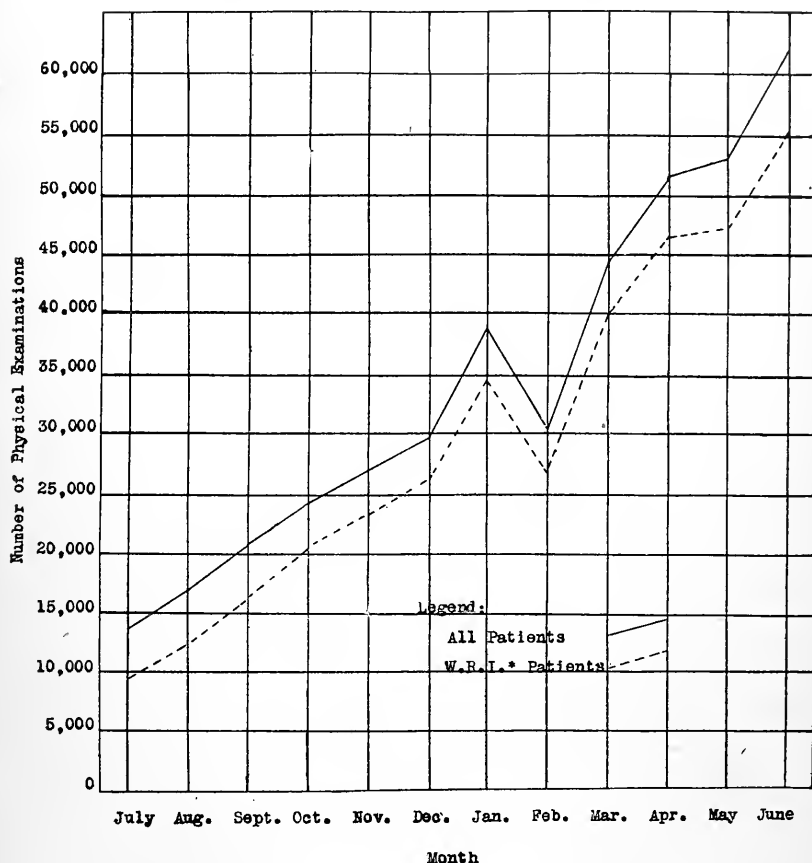
Number of office treatments furnished monthly at all stations of the Public Health Service, fiscal year 1920.



NOTE: Curves are plotted from data as reported; no correction made for different lengths of months.

PLATE III.

Number of physical examinations furnished monthly at all stations of the Public Health Service, fiscal year 1920.



* War Risk Insurance.

NOTE: Curves are plotted from data as reported; no correction made for different lengths of months.

PLATE IV.

Number of patients in hospital at the end of each month, fiscal year 1920.

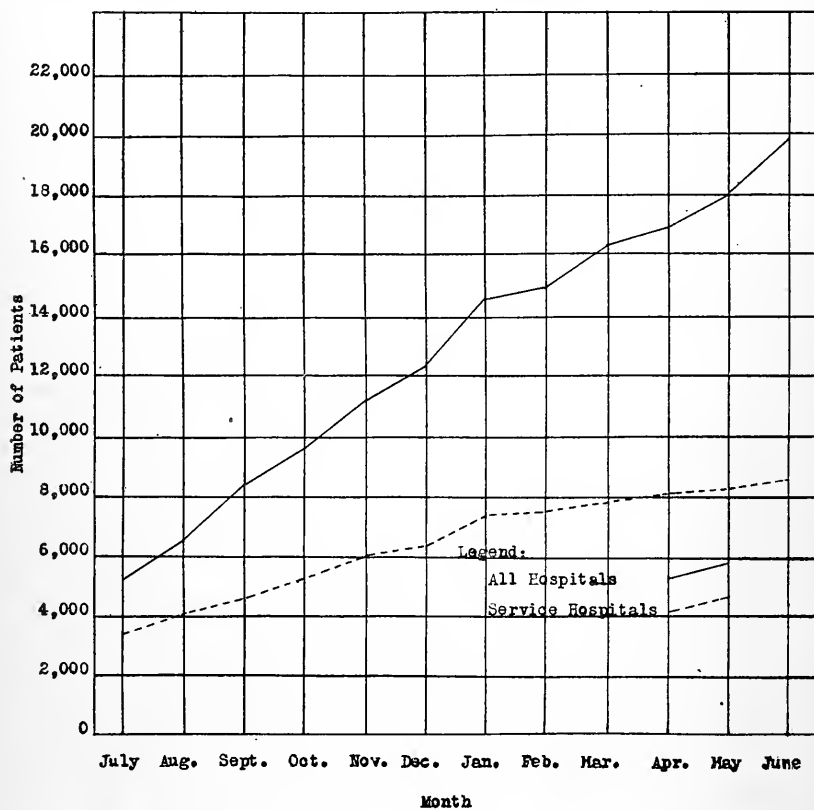


PLATE V.

Number of days' relief furnished yearly, fiscal years 1915-1920, inclusive.

ALL STATIONS PUBLIC HEALTH SERVICE.

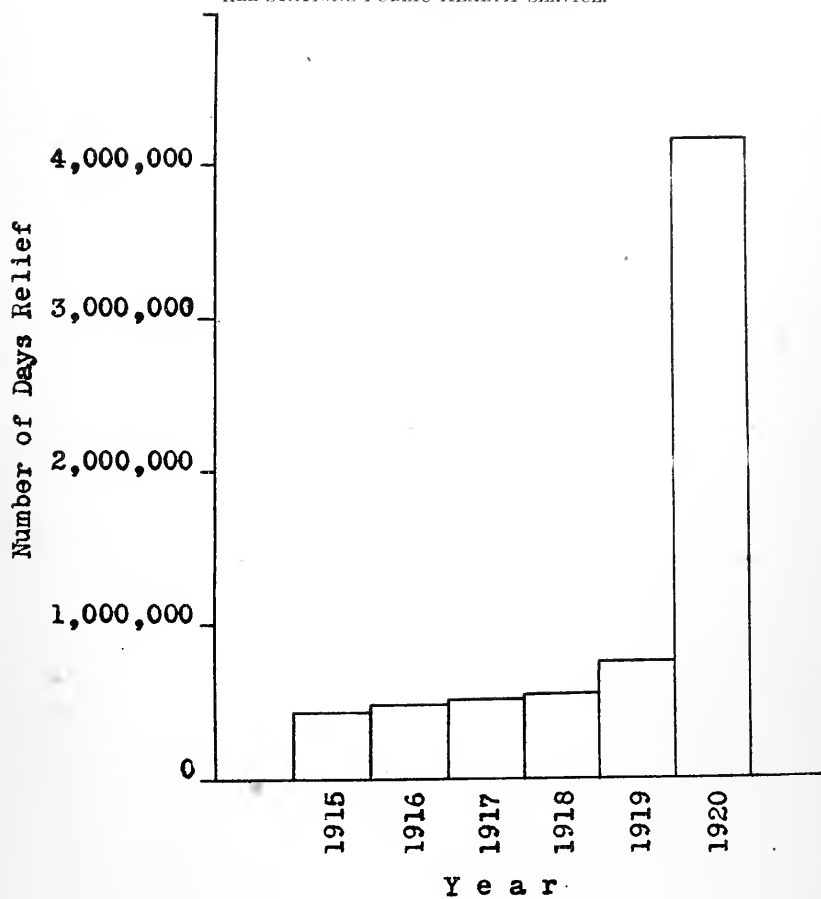


PLATE VI.

Number of patients in hospital at end of each year, fiscal years 1915-1920, inclusive.

ALL STATIONS PUBLIC HEALTH SERVICE.

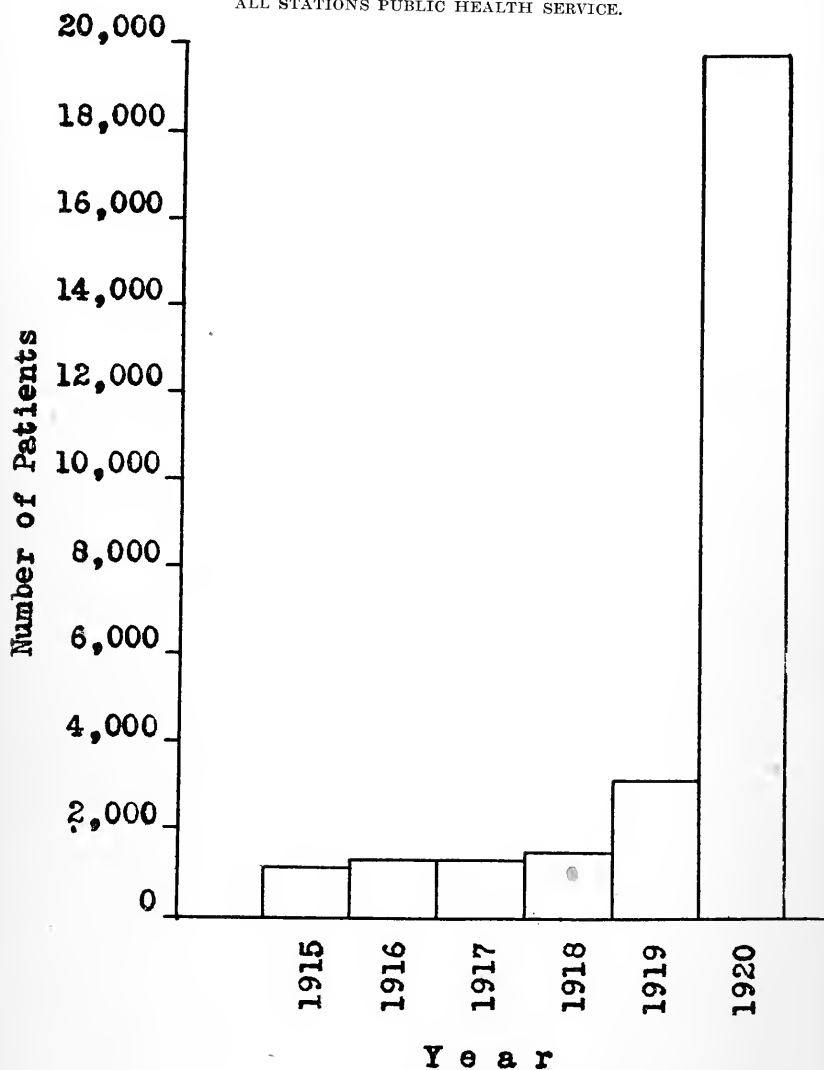


PLATE VII.

Number of office treatments furnished yearly, fiscal years 1915-1920, inclusive.

ALL STATIONS PUBLIC HEALTH SERVICE.

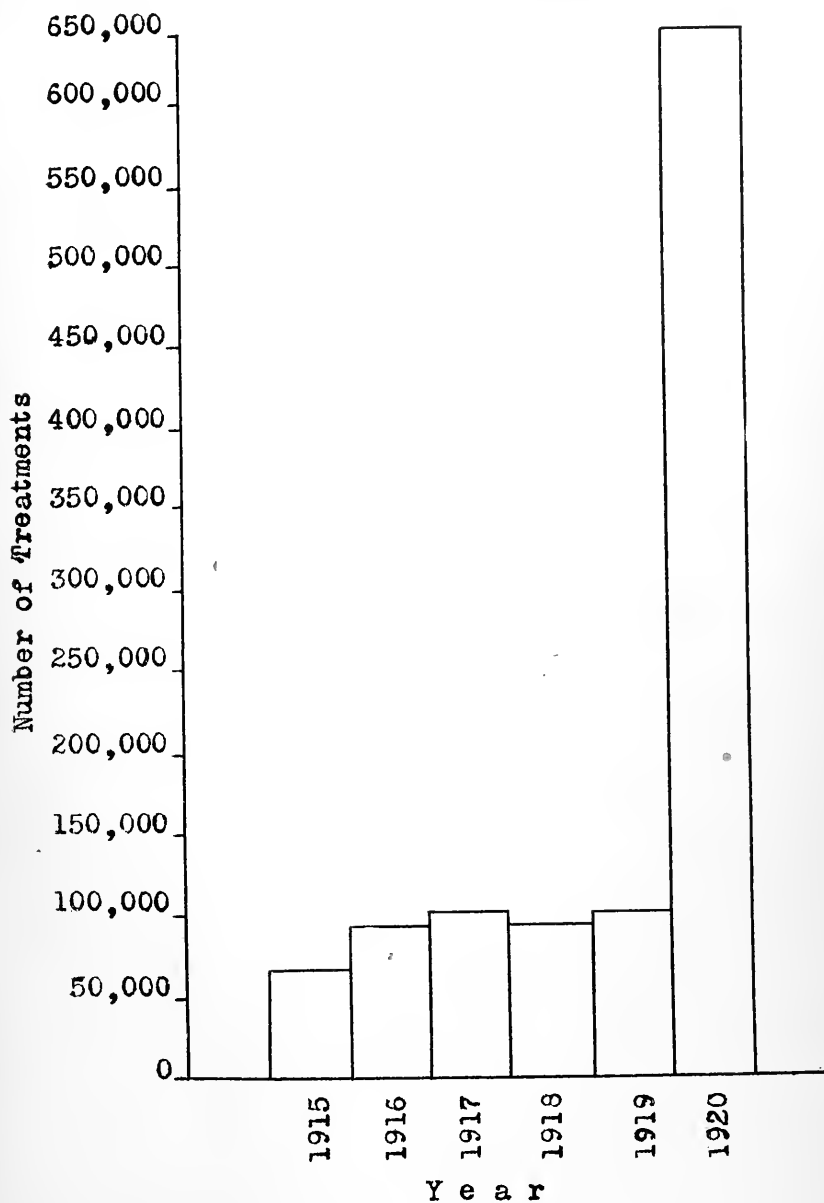


PLATE VIII.

Number of physical examinations furnished yearly, fiscal years 1915-1920, inclusive.

ALL STATIONS PUBLIC HEALTH SERVICE.

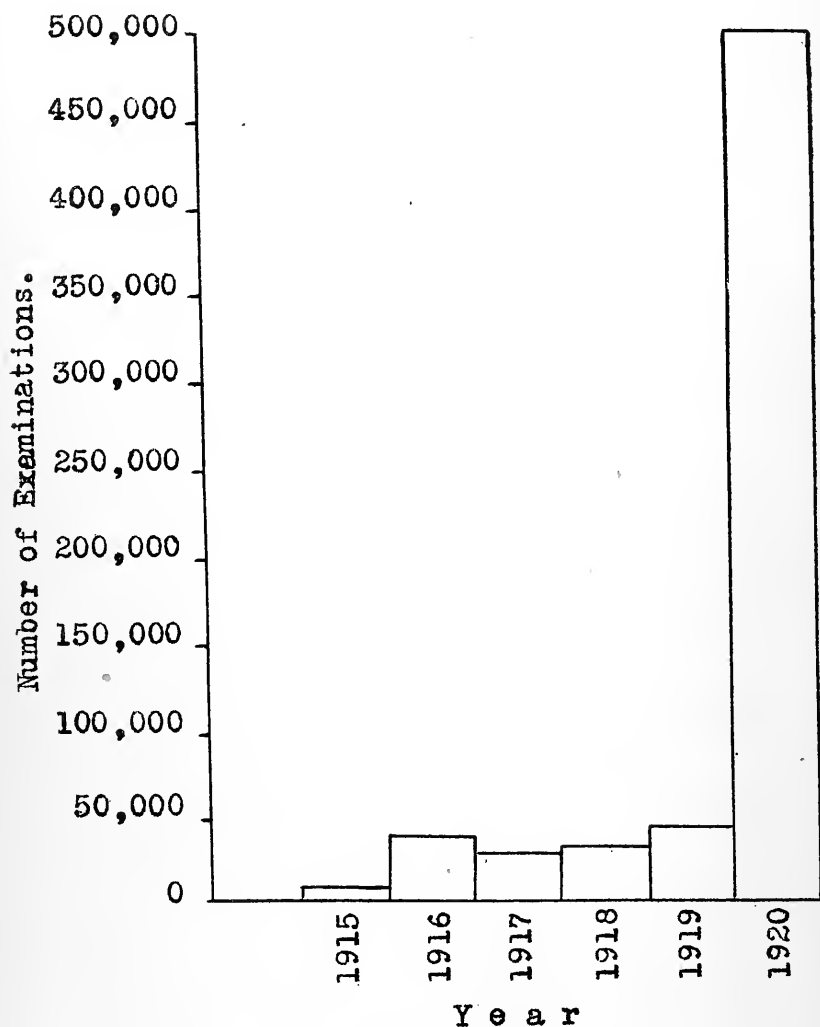


PLATE IX.

Number of patients treated in hospital yearly, fiscal years 1915-1920, inclusive.

ALL STATIONS PUBLIC HEALTH SERVICE.

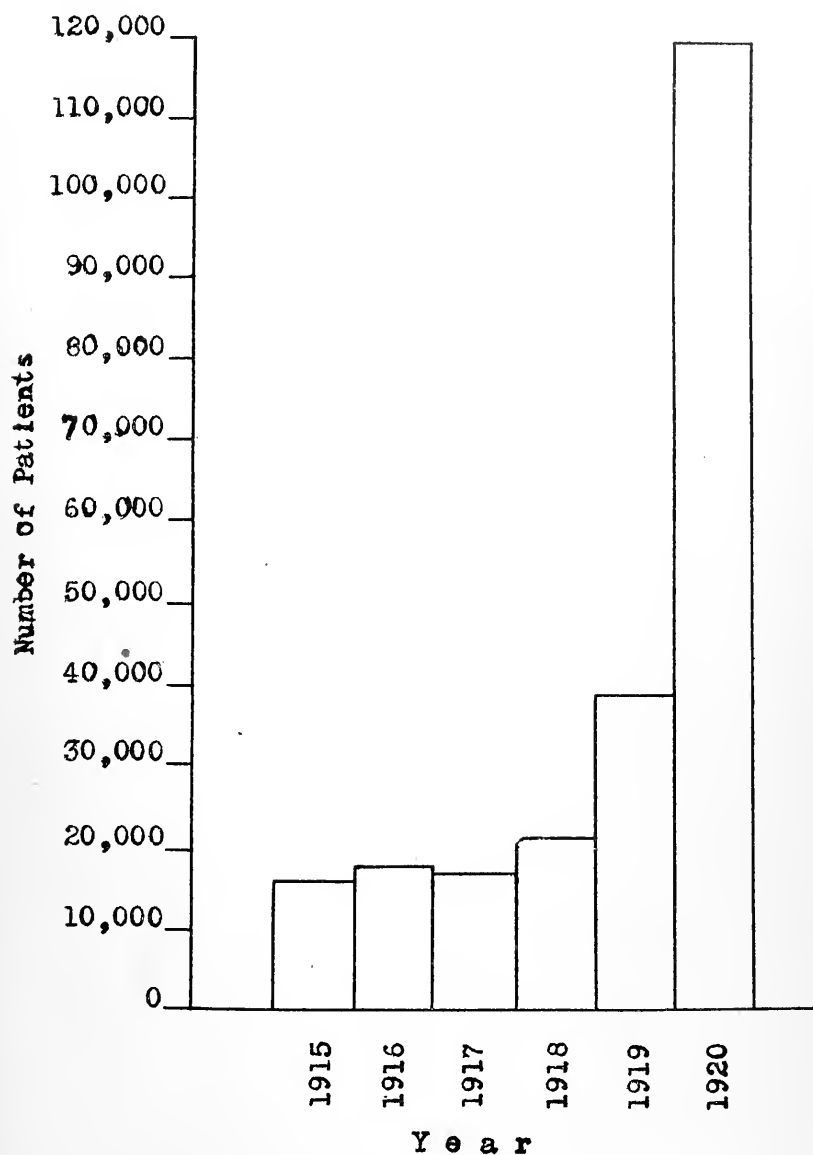
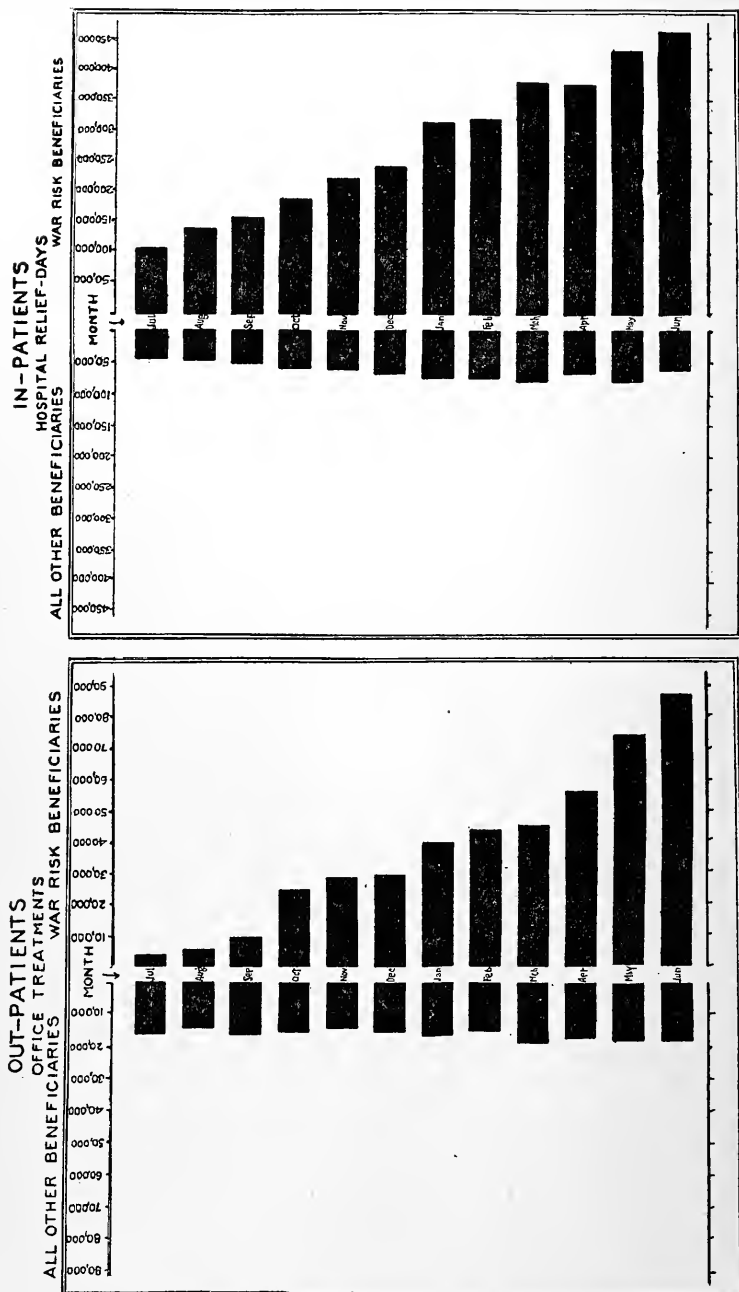


PLATE X.

Total relief by months, United States Public Health Service,
FISCAL YEAR 1920



RELIEF TO SEAMEN AND OTHER PATIENTS.

Nearly 400,000 patients were treated during the fiscal year at the various hospitals and relief stations of the service. Of the above-mentioned number, about 119,000 were treated in hospitals as in-patients, to whom a total of 4,151,338 relief days were furnished, and about 270,000 were treated at out-patient offices, a total of about 649,216 times. In addition to the foregoing, medical officers detailed for duty on board vessels of the Coast Guard furnished a great deal of medical relief to beneficiaries of the service and to natives of Alaska. The medical officers of the service, including acting assistant surgeons and designated examiners, made about 500,000 medical examinations during the year. Nearly 450,000 of these were on account of the Bureau of War Risk Insurance.

MAINTENANCE ACCOUNTS SECTION.

In July, 1919, the maintenance accounts section comprised five clerks, who handled all of the following proposals from service hospitals and the few district headquarters that were functioning, namely:

For furniture and equipment bought on the order of the medical officer in charge:

For services such as telephone, gas, electric current, burials, X-ray work, ambulance service, removal of ashes and garbage, garage space, officers' quarters, etc.:

For subsistence and other supplies.

Also proposals to furnish medical, surgical, and hospital supplies received from the purveying depot with recommendation; and

Proposals for repairs and alterations to buildings and mechanical equipment that are charged to the maintenance appropriations received from the construction section with recommendation.

Action on all of the above proposals (with the exception of those received from the Purveying Depot and the construction section) involves consideration as to the suitability of supplies, services, or equipment and reasonableness of prices, conferences with executive officers on all matters of doubt or new policy, preparation of indorsements for signature by the Surgeon General or the Assistant Secretary, and recording and filing correspondence and authorities.

Vouchers for expenditures on all proposals listed above, also exigency vouchers, are examined as to correctness of price and form, recorded, and sent to the Surgeon General for signature.

As the number of hospitals increased and new district supervisors were appointed, the work of this small section grew rapidly and it seemed advisable to relieve the maintenance accounts section of some of its functions. Therefore, on August 15, 1919, the Purveying Depot took over the work of handling proposals to furnish equipment and furniture for all hospitals, the offices of supervisors, and new stations throughout the districts.

In spite of the transfer to the Purveying Depot of the work of handling furniture and equipment proposals and vouchers, the maintenance accounts section grew from 5 to 35 clerks during the fiscal year, with immediate necessity for 5 more on July 1, 1920.

This section examined in 1920 all vouchers received from district supervisors representing expenditures for medical and hospital relief and the expenses incident thereto, except that the number of days charged on hospital vouchers was verified in another section.

This section also audited vouchers for all freight and express charges on shipments to service hospitals, supply depots, supervisors, and all other officers under the jurisdiction of the Hospital Division. These expenditures are charged to the proper appropriation and recorded.

Files of authorities and files of hospitals on contract are kept up to date so far as possible.

The vouchers prepared for payment in this section during the fiscal year ending June 30, 1920, cover expenditures of approximately \$10,500,000.

RECONSTRUCTION SECTION.

The reconstruction section was organized in July, 1919, to establish, supervise, and direct the work of the several branches of physiotherapy and occupational therapy as measures for improving the physical and mental condition of beneficiaries of the service, in order to establish and maintain a high standing of morale and to hasten the restoration of the patient to a state of functional and economic usefulness.

During the year the reconstruction work, including the amusements and recreations of the patients, and the activities under the direction of the Red Cross and other auxiliary agents has been co-ordinated and correlated with all the other activities of the Public Health Service.

This section was also responsible in great measure for establishing, fostering, and maintaining working relations between the Federal Board for Vocational Education and the Public Health Service in its several hospitals, it being understood that the Federal Board for Vocational Education is responsible for the educational and vocational training of all such patients, who, in the opinion of the medical officer in charge, are able to receive instruction without harm, and that occupational therapy as mental work and manual handicrafts for curative and diversional purposes are to be given to all bed and semi-ambulant patients and such ambulant patients as are not potential trainees of the Federal Board for Vocational Education.

The responsibility of determining the kind, quality, and quantity of prosthetic and orthopedic appliances necessary for the beneficiaries of the service, and of justifying all charges for these appliances is made a part of the duties of this section.

The actual work of reconstruction at the several stations was started during the month of September, 1919.

For the last week of the fiscal year, 1920, the operation of the reconstruction service extended to 42 stations and 102 reconstruction aids in physiotherapy were on duty in the service hospitals.

The reconstruction personnel on duty in the field and nominated as of June 30, 1920, consisted of 4 reconstruction officers (medical); 5 special instructors in occupational therapy; 48 head reconstruc-

tion aids; 229 reconstruction aids; 1 pupil reconstruction aid; 10 special male employees in physiotherapy; 2 special male employees in occupational therapy. Total, 299. At no time has a sufficient number of qualified persons been available for appointment to the service, to meet the demands of the several stations for reconstruction personnel to carry on the work in physiotherapy and occupational therapy.

Following are the totals of the consolidated weekly reports of reconstruction activities in the hospitals of this service for the fiscal year showing the gradual increase in the number of patients treated, in the number of treatments in physiotherapy, and the number of hours occupied in occupational therapy, during the year.

Week ending—	Patients physio- therapy.	Patients occupa- tional therapy.	Treatments physio- therapy.	Hours work occupa- tional therapy.
1919.				
Sept. 6.....	92	147	1,114	1,625
13.....	96	150	1,175	1,673
20.....	97	161	1,175	1,882
27.....	128	248	1,632	3,863
Oct. 4.....	151	282	1,486	1,667
11.....	185	283	1,681	1,667
18.....	241	379	2,396	2,047
25.....	244	416	2,750	2,570
Nov. 1.....	351	563	3,196	3,076
8.....	374	615	5,177	8,898
15.....	396	664	5,156	9,501
22.....	408	720	5,503	10,054
29.....	452	845	5,400	11,613
Dec. 6.....	579	1,390	6,902	21,272
13.....	618	1,575	7,269	23,534
20.....	679	1,686	7,809	21,371
27.....	632	1,508	5,293	15,846
1920.				
Jan. 3.....	706	1,560	6,935	13,835
10.....	840	2,694	8,446	20,778
17.....	912	1,964	9,813	21,013
24.....	1,064	2,029	10,104	22,218
31.....	1,076	2,038	10,345	23,171
Feb. 7.....	1,169	1,993	11,042	20,975
14.....	1,150	2,091	11,888	21,361
21.....	1,210	2,302	12,655	24,392
28.....	1,205	2,247	12,197	24,094
Mar. 6.....	1,373	2,296	13,524	25,065
13.....	1,309	2,341	13,922	24,074
20.....	1,331	2,405	14,085	23,463
27.....	1,665	2,355	14,006	24,550
Apr. 3.....	1,113	2,294	12,377	23,249
10.....	1,400	2,348	14,261	26,001
17.....	1,307	2,396	13,676	22,851
24.....	1,556	2,629	16,398	26,307
May 1.....	1,474	2,602	16,226	28,253
8.....	1,543	2,669	16,940	28,222
15.....	1,599	2,595	17,929	28,425
22.....	1,762	2,777	17,717	27,824
29.....	1,534	2,817	18,212	30,805
June 5.....	1,481	2,712	15,687	26,908
12.....	1,691	2,791	17,471	29,534
19.....	1,701	2,902	17,720	30,561
26.....	1,886	2,976	18,714	33,982

DISTRICT SUPERVISORS.

The district organizations, 14 in number, were created for the purpose of facilitating the examination, treatment, and hospitalization of all service beneficiaries, particularly those of the War Risk Insurance Bureau. The medical personnel consists of commissioned officers (regular and reserve), acting assistant surgeons (whole and part time), designated examiners (on a fee basis, paid by the War Risk Insurance Bureau), and attending specialists (salary or fee basis). This organization is designed to render available the services of one or more physicians in every county of the United States and in every city of 10,000 inhabitants or over, a plan which is rapidly being carried out. In addition, "hospital units" consisting of groups of attending specialists have been formed as adjuncts to the district offices and in connection with contract and service hospitals in many of the larger cities. Designated examiners (fee basis) are provided in communities where the number of beneficiaries does not warrant the use of salaried officers. The employment of a large clerical force has also been found indispensable.

On June 30, 1920, the medical personnel engaged in this work, by districts, was as follows:

District.	Commissioned officers.	Acting assistant surgeons.	Attending specialists.	Designated local examiners.	Total medical personnel on duty.
1.....	6	49	70	70	195
2.....	1	131	39	91	262
3.....	2	28	8	130	168
4.....	7	42	26	137	212
5.....	9	87	152	291	539
6.....	4	44	22	204	274
7.....	10	78	128	261	477
8.....	1	151	89	138	379
9.....	7	51	58	290	406
10.....	7	38	53	238	336
11.....	4	48	51	156	259
12.....	16	13	5	58	92
13.....	5	41	20	89	155
14.....	17	18	43	319	397
15.....	1	8	1	32	42
16.....	1	5	1	.....	7
17.....	1	1	.....	.....	2
18.....	1	1	.....	.....	2
Total.....	100	834	766	2,504	4,204

The following table shows the principal work performed:

Patients examined and treated during fiscal year ending June 30, 1920, through district supervisors' organizations.

District.	Total number out-patients examined and treated.	In-patients—Cases sent to hospital ¹ —					Total number patients examined and treated, out-patient and in-patient.
		For examination.		For treatment.		Total cases sent to hospital.	
		U. S. Public Health Service and marine.	Civil.	U. S. Public Health Service and marine.	Civil.		
1.....	9,024	1,331	510	2,395	² 985 1,356	6,577	15,601
2.....	30,002	3,070	1,713	3,370	² 1,685 3,160	12,998	43,000
3.....	14,461	259	322	1,510	² 992 1,179	4,262	18,723
4.....	9,052	833	485	664	² 314 1,651	3,947	12,999
5.....	8,022	2,203	926	3,055	² 690 3,104	9,978	18,000
6.....	16,230	241	140	1,011	² 926 498	2,816	19,046
7.....	21,934	495	1,299	903	² 794 2,622	6,113	28,047
8.....	24,094	2,336	868	2,865	² 3,081 2,655	11,805	35,899
9.....	11,419	1,629	1,971	2,128	² 984 2,630	9,342	20,761
10.....	7,136	.....	.....	39	² 426 2,399	2,864	10,000
11.....	6,245	.....	390	47	² 261 2,057	2,755	9,000
12.....	9,574	367	225	842	² 670 1,059	3,163	12,737
13.....	8,086	2	149	189	² 143 1,112	1,595	9,681
14.....	5,316	386	168	1,104	² 553 1,333	3,544	8,860
15 ³	⁴ 91	.....	.....	.....	140	140	231
16 ³	544	.....	1	.....	⁵ 200	201	745
17 ³	(⁶)	(⁷)	(⁷)	(⁷)	(⁷)	(⁷)	200
18 ³	(⁶)	(⁷)	(⁷)	(⁷)	(⁷)	(⁷)	(⁷)
Total.....	181,230	13,152	9,167	20,122	39,659	82,100	263,530

¹ Permits issued.

² Total number of patients sent to hospital up to Oct. 1, 1919. Classification of figures up to this date not obtainable.

³ District supervisors detailed primarily for quarantine work.

⁴ Figures for May and June not available.

⁵ Figures represent reports for April, May, and June.

⁶ Not available.

⁷ Figures negligible.

A conference of all district supervisors in the continental United States was held in Washington, D. C., in April, 1920, for the purpose of perfecting these organizations and standardizing working methods.

DENTAL SECTION.

On July 1, 1919, the dental section consisted of a chief dental surgeon and one assistant. The period of time from July 1, 1919, to November 4, 1919, was spent in locating and taking over such serviceable dental equipment, instruments, and supplies as could be released from the War Department, and in the determination of a policy to be followed with regard to the rendering of dental treatment to patients of the Bureau of War Risk Insurance. On November 4 the Secretary of the Treasury signed Treasury Department Circular

No. 165, which authorized the method of procedure to be used. Briefly, its provisions are as follows:

Detail of a supervising dentist to each district office; detail of dental officers to service hospitals, contract hospitals, and to out-patient clinics when needed; the appointment in rural communities and smaller cities and towns of dental officers on a fee basis. The circular contains instructions on modes of procedure, reports, records, and other requirements; classifies patients with regard to injuries and pathological conditions, local and general, and prescribes the kind and amount of treatment to be received by each class; finally, it prescribes a fee table for practically all dental services.

This circular remained in force until May 1, 1920, when the issuance of Treasury Department Circular No. 140 caused certain additional procedure to be inaugurated. This new procedure was thoroughly worked out and ready to be instituted at the end of the fiscal year.

The growth of the section has been extremely rapid. At the end of the fiscal year there were 100 officers on duty with the following grades: One senior surgeon, 6 surgeons, 18 passed assistant surgeons, 4 assistant surgeons, 58 acting assistant surgeons, and 13 acting assistant surgeons with pay and rating of internes. There are in addition 68 officers on duty as dental operators in United States Public Health Service and marine hospitals and clinics. There are 6 officers on duty in the dental section, Marine Hospital Division; 2 in the Bureau of War Risk Insurance; and 14 in district supervisors' offices, acting as chiefs of dental sections, with 10 officers assisting them in the supervision of the rendering of dental treatment to compensable patients of the Bureau of War Risk Insurance who are located in their districts. The work of the above officers is of a purely executive nature. In order that the organization of the dental section might be uniform in all 14 districts, classes were held at the bureau and such officers as were to be detailed for duty as chiefs of the dental sections were called for instruction. At the end of the fiscal year there was one uniform system being used in the offices of all the chiefs of the dental sections. The system used was based entirely upon the most up-to-date and approved methods of business efficiency, and has proven extremely successful in expediting the furnishing of treatment to patients.

CIVILIAN DENTAL EXAMINERS.

In accordance with the specifications of Department Circular No. 165, dental examiners were selected throughout the country under the supervision of the district supervisors. In selecting these dental examiners preference was given in all cases to ex-service dentists, if they were available and had the necessary qualifications. The State boards in charge of the registering and licensing of dentists were also requested to recommend capable, ethical practitioners, and the opinion of the medical examiners was also taken into consideration. The first dental examiner was selected during the month of December, and at the end of the fiscal year approximately 5,000 dental examiners had been selected.

A constant weeding-out process of the examiners has been necessary, due to the fact that in many instances the men did not wish to comply with the provisions of Department Circular No. 165. Many obstacles were also met with regarding the prices listed in that circular, as in many portions of the country the local fees far exceed those listed in Department Circular No. 165.

Treatment has been authorized for more than 17,000 patients, and the cost of these authorizations per month is as follows:

1919.	
November	¹ \$5,000.00
December	¹ 8,000.00
1920.	
January	¹ 21,000.00
February	49,625.25
March	119,361.00
April	244,999.00
May	299,685.00
June	295,186.00
Total	1,042,856.25

The number of patients whose treatment was completed during the time between the issuance of Department Circular No. 165 and the end of the fiscal year is as follows:

1919.	
November	None.
December	None.
1920.	
January	None.
February	205
March	727
April	1,332
May	2,352
June	2,490
Total	7,106

The actual cost of the above-listed completed cases per month is as follows:

1919.	
November	None.
December	None.
1920.	
January	None.
February	\$6,901.75
March	30,939.25
April	61,674.50
May	120,774.75
June	145,361.50
Total	365,651.75

¹ Approximately.

These figures show that the average cost of rendering dental treatment to a patient is \$51.45. This high cost per patient is due to two facts: First, that the service is receiving requests for dental treatment at the present time only from those badly in need of same; second, the vast number of restorations necessary due to teeth extracted while in the service and diseased teeth left in the mouth that now need extraction.

At the present time plans for the establishment of dental clinics to be placed in the large cities throughout the country are under way, and it is believed that upon the opening of these clinics a great saving in the cost per patient of rendering treatment will be noted. The clinics will have dental officers on duty, and the service of the dental examiners in these cities will be discontinued. It has been found that 60 per cent of the dental treatment rendered has been furnished in cities.

DENTAL CLINICS.

There are established at the present time 31 dental clinics; 29 of these are operated in connection with hospitals of the service and 2 in connection with district supervisors' offices.

A small part of the equipment of these clinics was obtained from the War Department, but it was found to be entirely unsatisfactory and to a great extent unserviceable; consequently it was necessary for the service to purchase a large amount of additional dental supplies and equipment. It is the desire of this section to make the dental clinics of the Public Health Service modern institutions of their kind and to have them fully equipped for the treatment of all conditions which properly fall within the province of a dentist. At the present time plans are under way for the establishment of additional dental clinics to be located in the large cities throughout the country. It has been determined that dental treatment may be rendered at a far lower cost in a clinic than through the medium of dental examiners. However, as it is impossible to place clinics in such positions throughout the country that they can care for all patients of the Bureau of War Risk Insurance, it will be necessary to retain the services of dental examiners to a certain extent, but in all cases where patients may be referred to a clinic for treatment this procedure is to be followed. It has been determined that a patient may be furnished dental treatment at a clinic of this service at a cost of approximately \$23 per patient, as opposed to \$51.45.

The first dental officer was assigned to a clinic in June, 1919. Owing to the fact that the section was not organized at that time, there is no record at hand as to the work accomplished. However, the number of patients treated and the treatment rendered them has grown steadily, until for the month of June, 1920, 1,865 patients were treated and 3,534 sittings were given.

X-RAY SECTION.

Commissioned personnel on duty:	
July 1, 1919 -----	13
July 1, 1920 -----	24
Civilian personnel on duty:	
July 1, 1919 -----	10
July 1, 1920 -----	30
X-ray cases (examinations) -----	52,487
X-ray exposures -----	88,954
X-ray units, bedside in service hospitals:	
July 1, 1919 -----	7
July 1, 1920 -----	33
X-ray units, base hospital, in service hospitals:	
July 1, 1919 -----	19
July 1, 1920 -----	37
X-ray equipments at service stations:	
July 1, 1919 -----	19
July 1, 1920 -----	44

During the fiscal year 1919-20 this section has performed the following duties:

Supervision of the purchase, transfer, and distribution of X-ray equipment, repair parts, accessories, and photographic materials used in the X-ray laboratories of this service.

Installation and repair of X-ray equipment and accessories at the various stations; instruction in the use and care of X-ray apparatus.

Recording of X-ray apparatus and personnel on duty in the X-ray laboratories.

Answering correspondence of applicants for positions as X-ray technicians in this service.

Advisor to the construction section relative to the location of apparatus and electrical connections in new and remodeled X-ray laboratories.

Advisor to the accountants of this division relative to X-ray work performed by contract laboratories.

Recommendations for the appointment and transfer of personnel where needed in X-ray laboratories

LABORATORY SECTION.

Combined clinical and bacteriological laboratories are operating in practically all hospitals and personnel has been secured. In addition laboratories have been established in a number of district headquarters and in connection with certain dispensaries. In many places it has been necessary to make annual contracts with established laboratories, particularly in connection with work required for patients in contract hospitals.

Practically all laboratories in service hospitals and wherever established are well equipped, but there is still much to be desired in the way of securing efficient workers.

At the close of the fiscal year inspections are being made of most of the service laboratories with a view to improving the work and as a check on laboratory methods and on the efficiency of the technical help.

SECTION OF NEURO-PSYCHIATRY.

Among the disorders and disabilities arising among the beneficiaries of the war-risk insurance act are special disorders affecting the mind and nervous system. The very nature of these disorders makes it necessary that special facilities should be provided for their treatment, cure, and after care. Some idea of the magnitude of the problem may be gathered from the fact that 76,588 such cases came under the observation of the Medical Corps of the United States Army alone. Upon the basis of this known fact the rate of mental and nervous diseases in the total military population of the United States is almost two per thousand.

For purposes of classification, these disorders are divided into four large groups, namely, diseases and injuries to the central nervous system, the psycho-neuroses, epilepsy, and the psychoses, the latter including the insane. The term "neuro-psychiatric" disorder is now quite generally used to include all of the above-mentioned diseases.

The section of neuro-psychiatry established in the Hospital Division of the service is concerned with administrative problems relative to the examination, care, and treatment of this class of service beneficiaries. These activities relate to the development of temporary and permanent special-service hospitals, the establishment of special wards in general hospitals, the development of out-patient treatment and care, examinations and reports, the use of contract hospitals, and their inspection, and the development of a nursing and a social service corps in connection with the care and treatment of this class.

At the close of the fiscal year ended June 30, 1918, the Public Health Service had 225 beds for the care of the insane and 109 beds for the care of psychoneurotics. During the year ended June 30, 1919, the service had acquired 230 beds for epileptic beneficiaries and 258 additional beds for psychoneurotics, making a total of 488 beds for the care of the latter class of patients. During the last fiscal year the service has acquired facilities for 1,190 additional beds for the care of the insane alone.

Since the examination of nervous and mental patients requires special facilities to arrive at a definite diagnosis and provide appropriate treatment, the service has established at strategic points certain observation posts which are either separate and distinct hospitals or portions of general hospitals set aside for this purpose.

In the absence of governmental facilities the service has had to utilize by contract the existing facilities provided by the several States and private agencies. Such an arrangement is not entirely satisfactory to the patient, to the general public, or to the Government. Some idea of the magnitude of the work accomplished in respect to the care and treatment of this class of beneficiaries may be gathered from the facts that since March 3, 1919, 9,769 nervous and mental patients have been treated by the Public Health Service. Of this number 4,128 have been treated in Public Health Service hospitals and 5,641 in contract institutions.

Since such a large number of patients have been treated in hospitals under contract by the Public Health Service, it has been

necessary to establish a system of inspection in order that the Government might closely supervise the treatment afforded its beneficiaries in those hospitals. Through the sections of psychiatry established in the offices of the district supervisors, a nation-wide survey of all State and private institutions caring for nervous and mental patients has practically been completed. This inspection has revealed the fact that the standards of care of mentally disordered persons in the United States in public and private institutions vary considerably in the several districts, and furthermore shows the need for additional governmental facilities for the treatment of this class of beneficiaries.

Numerous out-patient clinics and dispensaries in connection with contract hospitals have been established for the aftercare and advice of persons discharged from the military forces who may be suffering from mental or nervous affections. The establishment of such out-patient clinics is important from an economic standpoint, because many such patients may remain in the community without other medical care when such facilities are available.

TUBERCULOSIS SECTION.

This section was organized after January 24, 1920, for the purpose of facilitating the examination, relief, hospitalization, and transfer of tuberculous seamen, patients of the Bureau of War Risk Insurance, and other beneficiaries of the service. A considerable volume of official correspondence from the field, as well as private inquiries, criticisms, and suggestions relating to tuberculous subjects and to sanatoriums are also routed to this office. The personnel on June 30 consisted of two medical officers and five employees. Considerable addition to the force and extension of the functions are contemplated.

A tuberculosis section was organized at headquarters in each of the 14 districts, the supervisor in this way controlling the examination and placement of tuberculous subjects. The training of medical officers for field duties was begun, a course of study prepared, and four sets of cinema films secured for schools of instruction in examination of the chest. Approximately 150 student officers took the prescribed course during April, May, and June. Standard procedure was outlined governing transfers to provide changes of climate and for other purposes.

Upon the recommendation of the advisory committee from the National Tuberculosis Association it is proposed to admit tuberculous patients to all general hospitals of the Public Health Service. Approximately 500 beds are thus available for purposes of diagnosis or for treatment of tuberculous patients unsuitable for transfer, to which will be added 250 beds when the tuberculosis wards of the Broadview Hospital, Chicago, are completed and approximately 100 others at Hospital No. 54, Arrowhead Springs, Calif. The service now has nine hospitals and sanatoriums reserved exclusively for tuberculous patients, aggregating 4,274 beds. The Fort Stanton Sanatorium is reserved, so far as possible, for merchant seamen.

An effort has been initiated to standardize the personnel and the treatment in service sanatoriums. A morale officer has been detailed to visit each institution in turn, to assist in instructing patients in

matters requiring their cooperation in treatment. A type of rest chair was selected for sanatorium use and a standard sanitary package of paper sputum cups and napkins was prepared for distribution to dispensary patients. The Purveying Depot is stocked with supplies of both these articles.

NURSING SECTION.

The nursing section began its organization very shortly after the passage of Public Act 326 by the appointment of a superintendent of the Nursing Corps, who was assigned to this division for duty. An organization was immediately begun by the appointment of a small clerical force and the necessary assistants, and a broad cooperative arrangement was entered into, after repeated conferences, with the American Red Cross, for the purpose of securing the adequate nursing personnel to meet the demands of what was expected to be a very extensive piece of work.

Previous to this fiscal year, cooperative arrangements with the American Red Cross were completed, and the necessary adjustments made with the Civil Service Commission for the employment of female nurses, and the broad foundations were laid for the organization of a female nursing corps for this division.

During the present fiscal year this work has steadily expanded and increased in volume, and at the present time the staff of this section consists of the superintendent of nurses, an assistant superintendent in the Washington office, and one assistant superintendent detailed partially to the Washington office and partially to the field for special supervision of neuro-psychiatric nurses, and a total clerical personnel of four persons. The recruiting of nurses has continued actively throughout the year to meet steadily increasing demands, until at the close of the year the nursing corps numbers a total of approximately 1,100 nurses, well organized, under the necessary chief nurses and head nurses for hospital duty. In addition, some nurses have also been assigned to district supervisors' offices. Cooperative relationships have also been established with the Federal Board for Vocational Education with regard to a small nursing force which has been found necessary to the prosecution of medical care for trainees of that board. Also, nurses have been assigned to the various dispensaries and to the dental service for special work.

The greatest problem with which the nursing section has been confronted is the inability to secure an adequate number of well-trained nurses suitable for this work, and the scarcity of nurses continues to be felt. In addition to this the rapid organization of a female nursing corps has thrown new burdens on the Public Health Service in the matter of securing adequate quarters and perfecting an organization for the discipline and management of so large a corps. These problems are being met gradually, but the question of quarters still remains a difficult one. It is believed that nothing would more contribute to the efficiency of the nursing corps and to higher morale than the supplying of adequate and proper quarters in which to house this personnel.

In the discipline of the nursing corps there has been found to exist a certain spirit of unrest, which is by no means confined to any

one group of persons, and this has resulted in a very large turnover, which it is hoped may be avoided during the coming year, because it does much to militate against the efficiency of the corps, and renders more difficult the establishment of a high morale.

It can be said, however, that the nurses who have been recruited are believed to be, generally speaking, women of the highest class of the nursing profession, and they have given faithful and devoted service under many trying conditions in the field.

One difficulty of consequence, which must be met, is the promotion of plans to secure an adequate and competent nursing service for the care of neuro-psychiatric patients, because the nurses who care for these patients should be specially trained in this work, and many such nurses are not available. It would appear at the present time that some effort would have to be made to train a special corps of nurses for this purpose. This same suggestion necessarily arises with regard to the recruiting of all nurses, although up to the present time, the Public Health Service has not felt justified in attempting to start any organization for the training of pupil nurses.

It is hoped that during the coming session of Congress some personnel bill may receive serious consideration which would place the nursing corps upon a better basis and give them the pay, allowances, and privileges which are accorded to the Nursing Corps of the Army and Navy; otherwise, the Public Health Service will find extreme difficulty in establishing an efficient nursing corps on a permanent basis.

DIETETIC SECTION.

The dietetic section of the Hospital Division was late in being formed. The superintendent of this section was not secured and appointed until September, 1919. Previous to that time, the purchase, preparation, and supplying of food was performed under arrangements which had existed in the old regulations of this service. In this month, however, a superintendent of dietitians was appointed, and the organization of this section was begun.

The office of this section during this fiscal year has remained small, and consists of one superintendent of dietitians and one clerical assistant. Much of the time of the superintendent of dietitians has been spent in the field correcting some very important defects in the dietetic service in the hospitals of the service. Nevertheless, the work in the organization of this section has proceeded steadily, and at the close of the year there were on duty approximately 85 dietitians operating in the hospitals of the service.

In addition to this, some matters of large policy have been determined, and the work of this section is now progressing favorably. One of the most important larger matters was the decision to place in the hospitals of the service the entire responsibility for the purchase, preparation, and serving of food, under the dietitians. This policy, while it met with some opposition on the part of the field force, has gradually gained ground, and may now be considered a success. It has done a great deal to place upon a better basis the question of feeding, and has resulted in supplying to individual

patients a better balanced ration, which is better prepared and better served.

The dietitians of the service, of course, operate under the general supervision of the medical officer in charge, but are responsible for all the details in the purchase, preparation, and serving of food, with the management of all personnel connected therewith. It has been by no means easy to secure graduate dietitians with the requisite ability to manage problems of this size, but with experience, and with the expansion of the organization, it has been found possible to meet fairly adequately the problems presented by the various hospitals, and the organization is now functioning in a satisfactory manner.

The same difficulties have been met in securing dietitians as have been found to exist in securing nurses. The demand has far exceeded the supply, and the salaries paid by the Government are not comparable to those which can be secured in civilian institutions. For this reason it has been difficult to obtain well-qualified and well-trained women. The dietitians also have not escaped the unrest which has been so prevalent among all classes of people during the past fiscal year.

During the coming fiscal year, in addition to expanding the organization already begun, it is felt that this organization should now take on certain responsibilities which hitherto have been left to other agencies—that is to say, that the central organization will be expanded during the coming year and will extend its supervisin in a broader manner over the field agencies with regard to greater care and economy in the selection of foodstuffs, the prices paid for the same, and their manner of preparation, with the establishment of dietaries more nearly in accord with standards which are set by the central organization.

The remarks which have been made regarding the nursing service and the inadequacy of the quarters, apply with equal force to the dietitians. The rapid expansion of the Public Health Service has rendered it necessary to quarter these young women many times in places totally unsuited and very uncomfortable. It is greatly to their credit that they have been willing to function under such circumstances, and to do so cheerfully. It is felt, however, that every effort should be made as soon as possible to supply them with better quarters and that everything possible should be done to improve the morale of this highly important service.

DISPENSARY SECTION.

Out-patient relief is provided for beneficiaries of the United States Public Health Service by means of dispensaries in the marine and other Public Health Service hospitals, offices of district supervisors, relief stations, and acting assistant surgeons. The physical equipment, therefore, varies from a large, highly developed unit composed of many special clinics for diagnosis and treatment to that of the office of a private practitioner on part-time service in a sparsely settled district.

In 1920 the out-patient service was greatly increased by the rapid growth of the number of ex-service men examined and treated in con-

nection with war-risk insurance. In order to provide more time for these and other beneficiaries the office hours of the dispensaries were extended to include Saturday afternoons and evenings of all week days in Boston, New York, Philadelphia, Washington, Chicago, New Orleans, and San Francisco.

Dispensaries were established with various special clinics in Denver, Cincinnati, Philadelphia, Mobile, and Chicago.

Dispensaries are in process of establishment at New Haven, Memphis, San Francisco, St. Louis, Minneapolis, and Boston.

In each instance an effort has been made to coordinate the work of existing stations of the service and to locate the dispensaries in the central or business section of the city.

A standard list of drugs for dispensary purposes has been prepared, and a standard list of supplies for medical, surgical, and special clinics is in the course of preparation.

CONSTRUCTION SECTION.

The office of the constructing engineer has grown from a small organization to one of rather large proportions on account of the great number of stations that have been acquired by purchase, transfer, and lease. The following is a list of Public Health Service hospitals under the immediate control of the Bureau of Public Health as of June 30, 1920:

No.	Location.	Designation.	Ownership.
27	Alexandria, La.	Camp Beauregard.	Land leased; buildings owned.
54	Arrowhead Springs, Calif.	Arrowhead Springs Hotel.	Land and buildings leased.
48	Atlanta, Ga.	Cheston King Sanatorium.	Land and buildings owned.
	Augusta, Ga.	Camp Hancock.	Land leased; buildings owned.
6	do.	Lenwood Hotel.	Land and buildings leased.
56	Baltimore, Md.	Fort McHenry.	Land and buildings owned.
45	Biltmore, N. C.	Kenilworth Inn.	Land and buildings leased.
52	Boise, Idaho.	Boise Barracks.	Land and buildings owned.
36	Boston, Mass.	Parker Hill.	Land and buildings leased.
40	Cape May, N. J.	Naval station.	Do.
	Chicago, Ill.	Broadview.	Land and buildings owned
30	do.	Cooper Monotah.	Land and buildings leased
	Corpus Christi, Tex.	Corpus Beach Hotel.	Land and buildings owned
28	Dansville, N. Y.	Jackson Health Resort.	Land and buildings leased.
	Dawson Springs, Ky.	Public Health Service Hospital.	Land and buildings owned.
46	Deming, N. Mex.	Camp Cody.	Land leased; buildings owned.
53	Dwight, Ill.	Keeley Institution.	Land and buildings leased.
34	East Norfolk, Mass.	Norfolk State Hospital.	Do.
43	Ellis Island, N. Y.	Immigration station.	Land and buildings owned.
55	Fort Bayard, N. Mex.	Army sanatorium.	Do.
26	Greenville, S. C.	Camp Sevier.	Land leased; buildings owned.
	Helena, Mont.	Fort William H. Harrison.	Land and buildings owned.
39	Hoboken, Pa.	Parkview Hospital.	Land and buildings leased.
25	Houston, Tex.	Camp Logan.	Land leased; buildings owned.
33	Jacksonville, Fla.	Camp Johnston.	Do.
57	Knoxville, Iowa.	Inebriate farm.	Land and buildings leased.
	Lake City, Fla.	Columbia College.	Land and buildings owned.
47	Markleton, Pa.	Markleton Hotel.	Land and buildings leased.
41	New Haven, Conn.	New Haven Hospital.	Do.
58	New Orleans, La.	Belvidere Mental Infirmary.	Do.
	New York, N. Y.	Hudson and Jay Streets.	Lands and buildings owned.
38	do.	Polyclinic.	Land and buildings leased.
29	Norfolk, Va.	Sewells Point.	Land and buildings owned.
24	Palo Alto, Calif.	Camp Fremont.	Land leased; buildings owned.
42	Perryville, Md.	Ammonia nitrate plant.	Land and buildings owned.
49	Philadelphia, Pa.	Naval hospital.	Do.
50	Prescott, Ariz.	Whipple Barracks.	Do.
35	St. Louis, Mo.	City Infirmary Hospital.	Land and buildings leased.
51	Tucson, Ariz.	Pastime Park.	Do.
32	Washington, D. C.	Mount Alto.	Land and buildings owned.
37	Waukesha, Wis.	Resthaven Sanatorium.	Do.
44	West Roxbury, Mass.	West End Hospital.	Land and buildings leased.

The work involving upon the office of the constructing engineer may be enumerated as follows:

First. To investigate and report upon property offered for acquisition by lease or purchase for the use of the Public Health Service either a hospital or quarters in connection therewith, or as office space for district supervisors or other field officers of the service.

Second. To negotiate the purchase or lease of acceptable properties and prepare papers in connection with the acquisition.

Third. To examine papers after purchase or lease with the view of determining the extent of repairs and alterations that are necessary to make them adaptable for use.

Fourth. To prepare drawings and specifications to cover new construction and also for alterations and repairs.

Fifth. To supervise the work in the field by a special representative of this office, the work in the field, as a rule, being performed by the open-market purchase of material and hire of labor. While this method of procedure has a tendency to expedite the completion of work it increases the responsibilities of the Public Health Service for the reason that each station must have a competent organization to carry on the work.

In accordance with the approval of the Secretary of the Treasury funds relating to the following-named projects have been transferred to and are under the control of the supervising architect as of April 1, 1920:

Chicago, Ill. (Maywood).

Dawson Springs, Ky. (Public Health Service Hospital).

Norfolk, Va. (Sewells Point).

New York Marine Hospital (Stapleton).

The organization of a section on construction in the Hospital Division, under the circumstances of the work, seemed necessary, and this organization has fulfilled a highly useful function in the Hospital Division. In fact, it would have been impossible successfully to prosecute the work intrusted to this division without a section on construction. The creation of this section has, however, introduced a feature into the organization which is far from satisfactory, because it has in a sense apparently usurped some of the functions of the Office of the Supervising Architect, which it is far from the desire of the Public Health Service to do. The entire question has been the subject of repeated conferences with the Supervising Architect, and it would seem from present indications that within a short time the necessary adjustments will be made with that bureau by which there will be no duplication of work or overlapping of responsibility. It is the earnest desire of the Public Health Service that the construction work of this Service shall be done by the properly constituted agency for the Treasury Department, which is the Office of the Supervising Architect. The Supervising Architect himself has expressed the opinion that there is a real need for a small construction section in the Hospital Division of the Public Health Service operating in cooperation with his bureau and charged with certain very definite and limited matters which his bureau does not care to take charge of at the present time. It is hoped that in my next annual report I shall be able to state that this matter has been settled to the satisfaction of all parties concerned and for the best interests of the work involved.

The following is a brief résumé of the work performed on Public Health Service Hospitals and a brief history in regard to each project:

ALEXANDRIA, LA.

Public Health Service Hospital No. 27, formerly known as Camp Beauregard, was acquired by the Public Health Service from the United States Army under date of April 24, 1919. The land on which this property is located is owned by the State of Louisiana. The buildings were erected by the United States Army and are now the property of the United States Government. The Government pays no rental to the State of Louisiana and occupancy of the premises is at the pleasure of the State. The work carried on at the station during the past fiscal year has been that of improving the water supply and sewerage system and alterations and repairs to some of the buildings for the care of patients. The bureau now contemplates erecting a refrigeration plant, milk plant, and improving additional wards and mess hall and kitchen. The work so far has been performed by the open-market purchase of material and hire of labor under the immediate direction of the medical officer in charge. Present capacity is 550 beds.

ARROWHEAD SPRINGS, CALIF.

Public Health Service Hospital No. 54. This property is located in southern California, leased from the Arrowhead Springs Co., and was formerly utilized as a hotel. This property was leased from the Arrowhead Springs Co. under date of February 9, 1920, with renewal privileges until after June 30, 1924. This hospital has a capacity of 100 beds, and it is the intention to remodel the present property to increase the bed capacity twofold. Work is now progressing toward that end under the supervision of a superintendent of construction, work being carried on by the open-market purchase of material and hire of labor.

ATLANTA, GA.

Public Health Service Hospital No. 48. This property, formerly known as the Cheston King Sanitarium, consists of an up-to-date hospital on a tract of land consisting of approximately 21 acres on the Peach Tree Road, in Dekalb County, Ga., about 10 miles from the city of Atlanta. This property, with all buildings and equipment, etc., was acquired by purchase for the sum of \$165,000 on May 3, 1920. Possession of this property was acquired by the Public Health Service on February 2, 1920, and retained on a rental basis until May 3, 1920, pending the clearance of the title. Some minor alterations and repairs are now in progress to make it adaptable for use by the service. The work in question, being under the immediate supervision of a superintendent of construction, is carried on by the open-market purchase of material and hire of labor. The bed capacity of this hospital is approximately 100 beds.

AUGUSTA, GA.

Public Health Service Hospital. This property was known as Camp Hancock and was formerly occupied by the United States

Army, being transferred to the Public Health Service under date of July 2, 1919. The buildings within the hospital area are owned by the Government and the land is leased from the board of the Chamber of Commerce, Augusta, Ga. At the present time all the buildings and equipment are being salvaged, and the salvaged material is being shipped to various Public Health Service hospitals for use in connection with repairs and improvements. A portion of the hospital area will be retained for use in connection with the Public Health Service Hospital, Augusta, Ga., known as the Lenwood Hotel, referred to hereinafter.

This property, known as the Lenwood Hotel, consists of a hotel building located on approximately 20 acres of land, and was acquired by lease January 17, 1920, by the Public Health Service, with renewal terms for annual lease until June 30, 1925. The Government has an option to buy at any time should it so elect, the amount of rental prior to purchase to be deducted from the purchase price. Extensive alterations and remodeling of the hotel are being made to make this property suitable for hospital work. Supervision of alterations is under the direction of a superintendent of construction. Alterations and repairs are made by the owners, and they in turn are reimbursed for the expense involved. It is expected that when this work is completed the hospital will accommodate 200 beds.

BALTIMORE, MD.

Public Health Service Hospital No. 56, was formerly known as Fort McHenry Military Reservation, Md., and was transferred from the War Department to the Public Health Service under date of June 17, 1920, with reservations for use of the War Department of such buildings as were actually required by that department. The Public Health Service to have possession of aforesaid property for a period of five years from June 15, 1920. Negotiations are in progress with the Department of Labor for acquiring by transfer the use of buildings assigned to the Bureau of Immigration Service. The bureau, after a careful investigation of the buildings and premises, indicates that considerable expense will be involved in adapting these buildings for use by the service. It is the intention to carry on this work under the direct supervision of a superintendent of construction, who is now on the premises, by the open-market purchase of material and hire of labor. The capacity of this hospital is approximately 500 beds.

BILTMORE, N. C.

Public Health Service Hospital No. 45. The above property, secured by lease at Biltmore, is known as the Kenilworth Inn. A number of other properties within the immediate vicinity of the inn are used for office quarters, nurses' homes, etc. Very little money has been expended on this property for repairs and alterations, but due to inadequate heating facilities in the buildings and the Kenilworth Inn, it is desirable that heating apparatus will be placed in each structure for the benefit of the occupants. The present capacity of this hospital is 335. The property is acquired under lease for a period of five years.

BOISE, IDAHO.

Public Health Service Hospital No. 52, Boise, Idaho. This property is known as the Boise Barracks and was transferred to the Public Health Service by the War Department under date of November 20, 1919. Alterations and repairs have been made since the date of transfer and are still in progress. The bureau contemplates erecting additional wards, and when this work is completed the capacity will be approximately 200 beds. The work in progress at this time is under the direct supervision of a superintendent of construction and the method of procedure is by the open-market purchase of material and hire of labor.

BOSTON, MASS.

Public Health Service Hospital No. 36. This property is located in Parker Hill, city of Boston, and was acquired by the Public Health Service under date of August 4, 1919, by transfer of leases from the War Department. The property transferred included the following-named buildings:

- (1) Robert B. Brigham Hospital for Incurables.
- (2) Elks Reconstruction Hospital.
- (3) Boston City Hospital, West Department, West Roxbury.
- (4) Woman's Charity Club.
- (5) Wentworth Institute Barracks together with all utilities thereon.²⁰

Property known as Boston City Hospital is referred to in this report as a separate project and it is known as West Roxbury, Public Health Service Hospital No. 44. A portion of the property in connection with the Robert B. Brigham Hospital has been released by the Government to the owners to permit sale of same to the New England Baptist Hospital. Repairs of the above-mentioned property have been of a minor character and it is not the intention to make extensive alterations in the future.

CAPE MAY, N. J.

Public Health Service Hospital No. 40. This property, known as the naval training station, and occupied by the Navy, was transferred to the Public Health Service under date of August 28, 1919. The buildings are owned by the United States Government and land is owned by Mr. Henry Ford and was leased by the Navy Department under a very informal agreement at the rate of \$1 per year. The Public Health Service entered into an agreement with Mr. J. Clifford Wilson, of Philadelphia, for the rent of ground occupied by a railroad siding in connection with the Public Health Service Hospital at the rate of \$50 per annum. Considerable work has been done at the hospital in the way of alterations and remodeling for the care of patients, and at the present time about 135 beds are occupied. It is probable, due to the disinclination of Mr. Ford to continue the lease of this property to the Public Health Service, that the property will have to be abandoned and the buildings salvaged.

²⁰ Wentworth Institute Barracks has since been returned to the owners.

CHICAGO, ILL.

Public Health Service Hospital, formerly known as the Broadview Hospital, is now officially known as the Maywood Hospital. The above property consists of buildings and 320 acres of land and was purchased by the United States Government under date of March 13, 1920. It is expected that this hospital will be opened during the fall of 1920 and will accommodate 1,000 patients.

Public Health Service Hospital No. 30. This property is known as the Cooper Monotah Hotel and was formerly used by the Army as a hospital, being transferred to the Public Health Service under date of August 5, 1919, and consists of the hotel property and other buildings which are utilized for nurses' quarters, medical officers' quarters, and garage. Work performed at this hospital has been of a minor character, principally in repairs. The property may be continued under lease until June 30, 1922. Beds available, 550.

CORPUS CHRISTI, TEX.

Public Health Service Hospital No. 31 was acquired from the Army by transfer to the Public Health Service under date of May 31, 1919. This property was known as the Corpus Beach Hotel and was purchased by the Public Health Service under date of June 7, 1920. Area of land, including the building, is about $4\frac{1}{2}$ acres. Amount of sale, \$120,000. This property was utilized by the Public Health Service up to the night of September 14, 1919, when it was badly wrecked by a hurricane, and patients and medical corps were removed under peril of circumstances to other quarters and eventually to Alexandria, La. Plans and specifications are now in the course of preparation for remodeling this building, and it is expected that when it is completed 100 beds will be available.

DANVILLE, N. Y.

Public Health Service Hospital No. 28. This property, formerly occupied by the Army, was transferred to the Public Health Service under date of April 22, 1919, and consists of the Jackson Sanitarium and approximately 40 acres of land. This property is now under a yearly lease, and in view of the fact that the Public Health Service will relinquish control as of September 30, 1920, funds to a very limited extent have been expended for repairs and alterations, although under terms of the lease it will be necessary for the Public Health Service to replace the property in as good condition as when taken over by the Army, and under the circumstances the Public Health Service anticipates that it will take a considerable outlay of money to make repairs and alterations as may be required to meet the conditions of the lease.

DAWSON SPRINGS, KY.

Public Health Service Hospital. Under date of March 11, 1919, 5,000 acres of land, of which 200 acres are coal land, were donated to the Government as the site for a Public Health Service Hospital.

The bulk of this land is located in Hopkins and Christian Counties, Kentucky, about a mile south of Dawson Springs. On account of the undeveloped character of the country, it has been necessary to construct a highway from Dawson Springs to the site of the proposed buildings. This is now under construction and contracts have been awarded for the erection of several buildings forming part of a group which is planned to accommodate 500 tuberculosis patients. The construction of the roadway, including bridges and the water supply, is under the direct supervision of the Public Health Service. The building work is under the immediate supervision of the Supervising Architect of the Treasury Department.

DEMING, N. MEX.

Public Health Service Hospital No. 46. This property was occupied by the Army and was known as Camp Cody, being transferred to the Public Health Service under date of July 1, 1919. The buildings are owned by the United States Government, and the land, leased from the Deming Chamber of Commerce, consists of approximately 100 acres. Practically no repairs or alterations have been made, since it is not the intention to retain this property for any great length of time. It is expected that the buildings will be salvaged during the fall of 1920.

DWIGHT, ILL.

Public Health Service Hospital No. 53. This property was leased by the Government under date of March 1, 1920, and was formerly known as the Keeley Institute. The property consists of the Livingston Hotel, office and laboratory building, power house, and well house, and also the Grand Central Hotel building. The Public Health Service contemplates making the necessary alterations to make the property adaptable for hospital purposes.

EAST NORFOLK, MASS.

Public Health Service Hospital No. 34. This property is known as the Norfolk State Hospital and was leased from the Commonwealth of Massachusetts under date of July 1, 1919, with an option for renewal annually for four years. The Government expended very little for repairs and alterations and maintenance of this property. There are about 230 beds available.

ELLIS ISLAND IMMIGRATION STATION, NEW YORK.

Public Health Service Hospital No. 43. This hospital forms a portion of the Federal immigration station at New York. Under date of September 1, 1919, an agreement was made with the Bureau of Immigration whereby all the structures on island No. 2, consisting of three general hospital buildings, nurses' cottages, Red Cross building, psychopathic ward, and laundry, and contagious hospital group on island No. 3 are to be operated by the Public Health Service. Under this agreement 150 beds are available for ex-service

men, the remainder being reserved for immigrants. No expenditures have been made by the service in connection with this station.

FORT BAYARD, N. MEX.

Public Health Service Hospital No. 55. This property was transferred to the Public Health Service as of June 15, 1920, from the War Department. The War Department reserved the right to reoccupy this property at any time in case of an emergency and any alterations or modifications of a permanent character to the buildings on the premises must be approved by the War Department before execution. No alterations or repairs to the property have been made since the transfer and there are now approximately 1,000 beds available for patients.

GREENVILLE, S. C.

Public Health Service Hospital No. 26. This property was known as Camp Sevier and was transferred to the Public Health Service by the War Department. The buildings were erected by the War Department and the land acquired by lease. Leases covering the land have expired and new agreements are in the process of being drawn for continued use of their land. Funds to the extent of \$450,000 have been expended to fit the temporary buildings for the care of patients. This property is now one of the most complete hospitals under control of the Public Health Service, having an exceptionally large mess hall, kitchens, refrigeration plant, reconstruction milk plant, etc. The bed capacity at this time is 686.

HELENA, MONT.

Public Health Service Hospital. This property is a military reservation under the control of the War Department and loaned to the Public Health Service under date of November 20, 1919, for hospital purposes. Deficiency bill approved March 6, 1920, appropriated \$100,000 for remodeling and for alterations at this hospital, but funds have not been expended nor work undertaken on account of contamination of the water supply. It was first proposed to utilize this property as a neuropsychiatric hospital, but later it was decided best to fit it for a general hospital. The drawings and specifications are being modified for the purpose of carrying out work in accordance therewith.

HOBOKEN, PA.

Public Health Service Hospital No. 39. This property was leased by the Public Health Service under date of December 22, 1920. It is contemplated that this hospital will be relinquished about October 1, 1920.

HOUSTON, TEX.

Public Health Service Hospital No. 25. This property was occupied by the Army as a part of Camp Logan and was transferred to the Public Health Service as of July 1, 1919. The buildings within the reservation are Government owned and the land was acquired by lease.

Very little construction work has been done at this hospital, the buildings are temporary and not at all satisfactory, and the site is undesirable. Present bed capacity is 700.

JACKSONVILLE, FLA.

Public Health Service Hospital No. 33. This property was acquired by transfer from the Army and formed the hospital for Camp Johnston. The Public Health Service maintained a hospital at this point for a few months, but when better quarters were found available the patients located at Jacksonville were transferred to other points. The buildings, which are Government owned, and the equipment therein are now being salvaged and the material shipped to other hospital reservations throughout the country for use in construction and remodeling.

KNOXVILLE, IOWA.

Public Health Service Hospital No. 57. This property was leased under date of May 17, 1920, from the board of control of State institutions for the State of Iowa. It consists of 343 acres of land and a group of permanent buildings, which will have a bed capacity of 200 patients after a comparatively small outlay for rehabilitation.

LAKE CITY, FLA.

Public Health Service Hospital. This property was formerly known as the Columbia College and was purchased from the city of Lake City, Fla., under date of January 26, 1920, but due to difficulties encountered in clearing the title of the property, work on repairs and alterations of buildings was delayed. It is expected that from \$100,000 to \$150,000 will be required to place this property in first-class condition. A superintendent of construction is now on the premises, and the work is proceeding in a satisfactory manner.

MARKLETON, PA.

Public Health Service Hospital No. 47. This property was acquired under lease from the Markleton Hotel Co. under date of November 22, 1919, with a renewal option permitting occupancy of the said property by the Government until June 30, 1925. Considerable work is being done in repairing this property. At present there are approximately 150 patients being taken care of by this hospital.

NEW HAVEN, CONN.

Public Health Service Hospital No. 41. The above property was formerly utilized as an Army hospital and was transferred to the Public Health Service under date of September 12, 1919, and was operated under the Army lease. At a later date, the Public Health Service negotiated with the owners for the use of this property under a new lease approved May 24, 1920. On account of the large number of patients to be assigned to this hospital, the bureau contemplates erecting additional tuberculosis wards and remodeling the basement of the nurses' home to supply better facilities.

NEW ORLEANS, LA.

Public Health Service Hospital. This property, formerly known as the Belvidere Mental Infirmary, was acquired by lease under date of June 1, 1920, from the Shell Beach Land & Improvement Co., the Government reserving the right to occupy this property until 1925. A number of improvements are being made and rearrangement of mechanical equipment is now being carried out, and it is expected that this hospital will be open for patients within the next few weeks.

NEW YORK, N. Y.

Public Health Service Hospital. This property was officially known as 67 Hudson Street, and was purchased by the Government under date of June 3, 1919, for \$225,000. The building and equipment are now being entirely remodeled, and it is expected that this hospital will be opened by November 1, 1920.

Public Health Service Hospital No. 38. This hospital was occupied by the Army prior to transfer to the Public Health Service under date of August 5, 1919. The Public Health Service operated under the Army lease until June 30, 1920, and then exercised option in renewing said lease for one year. No construction work of any consequence has been done at this station.

NORFOLK, VA.

Public Health Service Hospital No. 29. The above hospital, known as the Army supply base hospital, was transferred from the War Department to the Public Health Service on May 29, 1919, and at the present time has a bed capacity approximately for 250 patients. The buildings are of the usual base hospital type of construction and required an expenditure of some \$65,000 for repairs and alterations to adapt them to the service's needs. Nine hundred thousand dollars was also appropriated under Act 326 for the purchase of a site and erection of permanent buildings at Norfolk, Va., and negotiations are now under way for the purchase of a site; the buildings to be of a permanent character, are to be constructed under the supervision of the Office of the Supervising Architect.

PALO ALTO, CALIF.

Public Health Service Hospital No. 24. This hospital, formerly located in the hospital area of Camp Fremont, was transferred to the Public Health Service by the United States Army under date of November 21, 1919, and consists of 89 acres of land. The buildings on the premises are owned by the Government and the land is leased. The Public Health Service is now negotiating with the owners of this property with the view of purchasing the land and maintaining a permanent hospital at Palo Alto.

PERRYVILLE, MD.

Public Health Service Hospital No. 42. This property was formerly occupied by the War Department and was known as the

ammonia nitrate plant, being transferred to the Public Health Service as of October 1, 1919, including all buildings, fixtures, and approximately 516 acres of land. The bureau has expended approximately \$120,000 in remodeling buildings into hospitals, and for a central supply depot for the entire service, having at present a capacity for 220 patients. This hospital and available cottages are used for the care and treatment of patients suffering from mental diseases.

PHILADELPHIA, PA.

Public Health Service Hospital No. 49. The above property was formerly occupied by the Navy and was transferred to the Public Health Service under date of February 1, 1920. The Public Health Service has made extensive alterations and improvements to these buildings. Bed capacity, 450 patients.

PRESCOTT, ARIZ.

Public Health Service Hospital No. 50. The above property, owned by the United States under the control of the War Department, was loaned to the Public Health Service on February 15, 1920, and consists of 1,731 acres of land, more or less, and all buildings and fixtures thereon. From the reports made and received from representatives in the field the bureau anticipates that a considerable amount of money must be expended to place this property in condition to permit proper care of discharged, sick, and disabled soldiers.

ST. LOUIS, MO.

Public Health Service Hospital No. 35. The above property, consisting of all buildings and equipment, comprising the city infirmary and all buildings and grounds constituting the isolation hospital, was acquired under lease dated November 15, 1918, renewable annually until June 30, 1925. Very little improvements have been made to this property by the Public Health Service.

TUCSON, ARIZ.

Public Health Service Hospital No. 51. The above property, consisting of approximately 25 acres of land, together with buildings thereon, was occupied by the Public Health Service under lease dated December 20, 1919, from private owner. Improvements of a minor character have been performed. The bureau expects to increase the bed capacity of this hospital by erection of portable buildings constructed of salvaged material received from Camp Deming, N. Mex.

WASHINGTON, D. C.

Public Health Service Hospital No. 32. The above property was leased by the Public Health Service as of June 15, 1919, for a period of five years. During the early part of the present fiscal year negotiations were entered into with the National School of Domestic Arts and Science for the purchase of this property, consisting of 11 acres,

more or less, and buildings and fixtures thereon, for the sum of \$460,000. It is expected that this sale will be consummated within the next few weeks. The bureau anticipates enlarging the bed capacity of this hospital and the construction work for the erection of new buildings, etc., will be done under the supervision of the Supervising Architect.

WAUKESHA, WIS.

Public Health Service Hospital No. 37. The above property, known as the Rest Haven Sanitarium, was acquired by purchase by the Public Health Service under date of April 3, 1919, for a sum of \$150,000, and consists of $5\frac{1}{2}$ acres of land, buildings, and equipment thereon. In addition to the above property, the Public Health Service acquired the Phelps property adjacent thereto under date of June 12, 1920, for the sum of \$14,000. Extensive improvements are now being made and it is expected that \$300,000 will be expended for completion of all work to be undertaken. This property is now caring for approximately 120 patients, and when improvements have been completed it is expected that the bed capacity will be increased to 300.

STATISTICAL SECTION.

This section was created in August, 1919, in order to meet an urgent need for financial and other statistical data in connection with hospital and district administration and the preparation of estimates for appropriations.

The work has resolved itself into two principal parts, namely, (a) the interpretation of available data and their presentation in such form as to prove of maximum assistance in the administration of the affairs of the division, and (b) the establishment of a system of reports and records which will furnish all the required information in the best possible form with the least expenditure of time and money.

During the fiscal year 1920 the following reports and charts have been started, and perfected, furnishing valuable information regarding patients, personnel, and relative costs in service hospitals:

- (1) Weekly census report (service hospitals).
- (2) Weekly census report supplement (civil hospitals).
- (3) Comparative cost charts (weekly).
- (4) Ration charts (monthly).
- (5) Progress charts—
 - (a) Beds at end of week, all service hospitals (totals).
 - (b) Beds at end of week, individual service hospitals.
 - (c) Occupied beds and personnel (logarithmic curves).
 - (d) General, tuberculosis, and neuropsychiatric in-patients under treatment.

A new system of patients' records has also been inaugurated during the fiscal year 1920. The old book register of patients has been replaced by 5 by 8 inch in-patient and out-patient cards. These cards are now handled in the statistical section. A complete follow-up and filing system has been instituted and is being perfected.

Before reaching the permanent files patients' records are coded on punch cards and are tabulated by means of tabulating machinery.

STATISTICAL TABLES.

TABLE I.—*Number of patients treated annually, 1868—1920, inclusive.*

Fiscal year.	Sick and disabled patients furnished relief.	Fiscal year.	Sick and disabled patients furnished relief.
Prior to reorganization:		After reorganization—Continued.	
1868.....	11, 535	1894.....	52, 803
1869.....	11, 356	1895.....	52, 643
1870.....	10, 560	1896.....	53, 804
After reorganization:		1897.....	54, 477
1871.....	14, 256	1898.....	52, 709
1872.....	13, 156	1899.....	55, 489
1873.....	13, 529	1900.....	56, 355
1874.....	14, 356	1901.....	58, 381
1875.....	15, 009	1902.....	56, 310
1876.....	16, 808	1903.....	58, 573
1877.....	15, 175	1904.....	58, 556
1878.....	18, 223	1905.....	57, 013
1879.....	20, 922	1906.....	54, 363
1880.....	24, 860	1907.....	55, 129
1881.....	32, 613	1908.....	54, 301
1882.....	36, 184	1909.....	53, 704
1883.....	40, 195	1910.....	51, 443
1884.....	44, 761	1911.....	52, 209
1885.....	41, 714	1912.....	51, 078
1886.....	43, 822	1913.....	50, 604
1887.....	45, 314	1914.....	53, 226
1888.....	48, 203	1915.....	55, 782
1889.....	49, 518	1916 ¹	68, 398
1890.....	50, 671	1917.....	64, 022
1891.....	52, 992	1918.....	71, 806
1892.....	53, 610	1919.....	93, 719
1893.....	53, 317	1920.....	389, 943

¹ Includes patients treated at trachoma hospitals.

TABLE II.—*Transactions at Marine and Public Health Service Hospitals, District Headquarters,¹ and other Relief Stations,² fiscal year 1920.*

Location.	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1920.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	
Grand total.....	389,943	119,047	1,802	19,813	4,151,338	270,896	649,216	513,293
FIRST CLASS STATIONS.								
MARINE HOSPITALS.								
1. Baltimore, Md.....	5,857	1,928	36	161	62,115	3,929	6,762	1,954
2. Boston, Mass.....	3,669	1,378	23	81	29,652	2,291	3,976	2,305
3. Buffalo, N. Y.....	2,409	581	12	32	13,167	1,828	3,217	3,069
4. Cairo, Ill.....	745	201	3	9	4,749	1,544	2,774	2,339
5. Chicago, Ill.....	3,752	2,428	22	99	46,955	1,324	2,021	2,505
6. Cleveland, Ohio.....	3,918	1,113	23	85	24,437	2,805	4,493	5,406
7. Detroit, Mich.....	1,766	3,994	21	74	23,699	772	1,670	826
8. Evansville, Ind.....	571	446	9	42	14,151	125	275	984
9. Fort Stanton, N. Mex.....	425	424	34	165	67,669	1	1	1,336
10. Key West, Fla.....	1,008	498	9	18	9,396	510	850	1,123
11. Louisville, Ky.....	1,975	950	11	53	17,755	1,016	1,118	1,220
12. Memphis, Tenn.....	1,517	867	17	30	16,382	680	1,311	689
13. Mobile, Ala.....	1,465	807	6	49	19,322	658	926	746
14. New Orleans, La.....	5,761	2,944	26	249	68,836	2,817	7,053	1,490
15. Pittsburgh, Pa.....	8,433	1,347	7	33	29,058	7,086	10,847	441
16. Portland, Me.....	757	505	8	26	13,386	252	330	740
17. Port Townsend, Wash.....	1,018	823	14	114	33,761	195	271	12
18. St. Louis, Mo.....	1,221	803	21	63	17,597	418	754	42
19. San Francisco, Calif.....	8,969	3,725	54	191	69,187	5,244	11,464	2,267
20. Savannah, Ga.....	6,031	1,123	24	69	29,159	4,908	18,208	1,051
21. Stapleton, N. Y.....	14,018	3,385	102	252	94,481	10,633	28,647	7,109
22. Vineyard Haven, Mass.....	150	90	2	11	3,699	60	95	5
Total.....	75,465	27,369	484	1,966	708,513	48,096	105,023	34,659
U. S. PUBLIC HEALTH SERVICE HOSPITALS.								
24. Palo Alto, Calif.....	1,412	1,332	52	445	136,290	80	233	59
25. Houston, Tex.....	88	59	0	6	712	29	8	32
26. Greenville, S. C.....	2,006	2,000	108	545	201,951	6	8	1,720
27. Alexandria, La.....	1,908	1,908	38	332	76,412	0	0	2,742

28. Danville, N. Y.....	311	309	12	217	80,282	2	4	46
29. Norfolk, Va.....	2,713	2,677	41	215	66,698	36		136
30. Chicago, Ill.....	12,729	7,612	54	470	197,053	5,117	16,216	2,105
31. Corpus Christi, Tex.....	172	149	1	0	3,964	23	45	3
32. Washington, D. C.....	7,196	1,462	24	75	46,186	5,730	16,301	5,733
33. Jacksonville, Fla.....	448	339	7	0	9,864	109	174	197
34. East Norfolk, Mass.....	478	478	3	114	25,827	8	23	59
35. St. Louis, Mo.....	6,012	4,156	37	399	128,431	1,856	4,118	70
36. Boston, Mass.....	481	3,794	27	386	106,291	3,254	6,135	80
37. Vankesha, Wis.....	439	403	2	122	33,319	36	20	91
38. New York N. Y.....	13,957	2,752	28	221	72,140	11,205	31,426	10,029
39. Parkview, Pa.....	531	464	2	297	65,701	67	106	42
40. Cape May, N. J.....	478	461	1	115	28,553	17	40	459
41. New Haven, Conn.....	1,378	1,250	50	381	105,909	128	1,296	1,475
42. Perryville, Md.....	462	266	4	114	19,625	106	463	142
43. Ellis Island, N. Y.....	5,903	5,842	129	460	99,692	61	102	0
44. West Roxbury, Mass.....	338	338	4	159	30,394	0	0	0
45. Baltimore, N. C.....	1,117	1,116	3	261	42,840	1	1	407
46. Deming, N. Mex.....	425	422	15	0	30,610	3	6	0
47. Markleton, Pa.....	206	206	4	123	12,181	0	0	23
48. Atlanta, Ga.....	216	215	0	21	4,637	1	3	0
49. Philadelphia, Pa.....	87	86	12	52	5,477	1	1	1,008
50. Prescott, Ariz.....	628	628	16	389	34,440	0	0	923
51. Tucson, Ariz.....	137	115	7	45	5,446	22	31	114
52. Boise, Idaho.....	55	55	1	48	1,862	0	0	28
53. Dwight, Ill.....	40	40	0	39	377	0	0	0
54. Arrowhead Springs, Calif.....	61	61	0	61	524	0	0	0
55. Fort Bayard, N. Mex.....	432	432	3	405	5,463	0	0	0
Total.....	69,414	41,422	685	6,522	1,679,371	27,992	76,850	28,173
Total (all first class stations).....	141,879	68,791	1,169	8,488	2,337,884	76,088	181,873	62,832
DISTRICT HEADQUARTERS. ¹								
1. Boston, Mass.....	7,922	1,995	14	910	74,965	5,927	23,062	24,473
2. New York, N. Y.....	6,181	4,145	21	1,509	203,086	2,036	43,154	113,697
3. Philadelphia, Pa.....	26,520	1,798	25	519	83,639	24,722	45,347	18,172
4. Washington, D. C.....	7,817	1,659	27	490	86,479	6,158	17,100	20,361
5. Atlanta, Ga.....	17,603	6,942	48	2,446	296,216	10,661	17,124	25,519
6. New Orleans, La.....	1,837	611	32	117	14,469	1,226	620	14,533
7. Cincinnati, Ohio.....	27,685	2,553	13	601	100,515	25,082	42,089	53,124
8. Chicago, Ill.....	3,375	3,375	21	396	90,372	0	0	0
9. St. Louis, Mo.....	11,925	5,235	38	935	145,657	6,690	12,354	41,964
10. St. Paul, Minn.....	14,868	2,490	63	617	127,369	12,378	54,129	19,837
11. Denver, Colo.....	14,188	1,946	13	790	74,088	12,242	29,433	9,461
12. San Francisco, Calif.....	14,468	1,088	44	449	88,518	13,370	14,086	13,992
13. Seattle, Wash.....	2,538	601	9	3	15,524	1,937	2,028	8,256
14. Houston, Tex.....	3,101	2,782	46	881	63,864	319	668	13,291

¹ District headquarters comprise relief reported by district supervisors and not included under first, second, third, and fourth class stations.

² Second, third, and fourth class stations.

NOTE.—(a) = (b) + (f).

TABLE II.—*Transactions at Marine and Public Health Service Hospitals, District Headquarters, etc.—Continued.*

Location.	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1920.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including idios.
DISTRICT HEADQUARTERS—Continued.								
15. Manila, P. I.....	1,445	326	10	59	11,590	1,119	2,186	841
16. San Juan, P. R.....	1,388	722	6	97	24,831	666	804	210
17. Honolulu, Hawaii.....	1,002	340	16	42	12,198	662	1,110	197
18. St. Thomas, V. I.....	738	100	1	3	1,889	638	1,763	38
Total.....	164,541	38,708	447	10,864	1,575,969	125,833	308,257	380,399
SECOND, THIRD, AND FOURTH CLASS STATIONS.								
Albany, N. Y.....	105	15	1	1	382	90	143	0
Ancon and Colon, Canal Zone.....	1,670	848	8	49	15,541	822	1,025	15
Apalachicola, Fla.....	148	36	0	1	399	112	248	5
Ashland, Wis.....	114	28	0	1	547	86	124	14
Ashrabula, Ohio.....	189	17	1	1	168	172	294	148
Astoria, Oreg.....	275	61	3	6	935	214	353	32
Bangor, Me.....	41	16	0	6	403	25	30	284
Bay City, Mich.....	29	5	1	0	27	24	50	48
Beaufort, N. C.....	237	29	1	1	499	208	562	39
Bealingsham, Wash.....	225	32	1	2	1,493	193	483	184
Boothbay Harbor, Me.....	60	11	1	0	254	44	73	9
Bridgeport, Conn.....	11	11	0	0	132	0	0	0
Brooklyn Supply Base, N. Y.....	1,548	0	0	0	0	1,548	2,927	933
Brunswick, Ga.....	92	14	0	1	295	78	112	25
Burlington, Iowa.....	130	109	4	4	1,783	21	25	352
Cambridge, Md.....	98	22	1	1	407	76	111	75
Cedar Key, Fla.....	1	0	0	0	0	1	1	1
Charleston, S. C.....	1,173	322	3	11	7,651	851	1,062	584
Chilmark, Ohio.....	2,908	898	3	42	9,722	2,010	2,912	9,875
Cincinnati, Ohio.....	19	1	1	0	254	107	13	0
Cordova, Alaska.....	139	32	0	1	419	107	178	152
Crisfield, Md.....	246	0	0	0	246	246	346	2,662
Curtis Bay Ordnance Department, Md.....	39	11	0	0	123	21	21	65
Devils Lake, N. Dak.....	243	13	0	0	185	230	245	353
Duluth, Minn.....	40	0	0	0	0	69	85	6
Eastport, Me.....	50	25	0	0	34	25	24	6
Edenton, N. C.....	131	9	0	0	40	122	287	55
Elizabeth City, N. C.....								

Erie, Pa.....	547	66	3	3	755	481	636	646
Escanaba, Mich.....	123	48	0	2	533	75	77	96
Eureka, Calif.....	183	38	0	0	383	145	220	39
Fernandina, Fla.....	52	8	0	0	85	81	81	3
Galipolis, Ohio.....	195	107	0	4	1,007	88	150	589
Galveston, Tex.....	3,726	729	6	27	9,249	2,997	6,925	111
Georgetown, S. C.....	63	3	0	0	74	60	102	111
Gloucester, Mass.....	134	9	0	0	256	125	304	688
Grand Haven, Mich.....	69	8	0	0	86	61	147	244
Green Bay, Wis.....	124	79	0	14	1,727	45	56	438
Gulfport, Miss.....	74	20	0	0	331	54	66	1,381
Hammond, N. J.....	158	0	0	0	0	158	836	291
Hancock, Mich.....	149	0	0	0	0	149	189	142
Hartford, Conn.....	6	6	0	0	198	0	0	7
Hogutiam, Wash.....	80	25	1	0	344	55	131	255
Irrington, Va.....	21	0	0	0	0	21	26	13
Jacksonville, Fla.....	557	179	0	0	2,293	378	635	474
Jacksonville, Tenn.....	107	0	0	0	107	107	641	0
Jeffersonville, Ind.....	110	0	0	0	0	110	196	0
Juneau, Alaska.....	91	27	4	1	692	64	232	19
Kansas City, Mo.....	987	581	12	0	9,770	406	604	3,581
Ketchikan, Alaska.....	157	40	0	0	418	117	263	1,334
Kearney, Wis.....	91	32	0	0	397	53	121	28
Leaves, Del.....	201	11	0	0	54	190	303	40
Little Rock, Ark.....	0	0	0	0	0	0	0	952
Los Angeles, Calif.....	6,328	1,039	0	0	13,898	5,289	5,770	5,369
Ludington, Mich.....	119	19	0	0	155	100	170	121
Macbias, Me.....	20	10	1	0	184	10	23	36
Manitowoc, Mich.....	62	13	2	1	293	49	80	14
Marquette, Wis.....	77	42	1	0	555	35	49	89
Marshfield, Mich.....	58	12	0	3	168	46	62	225
Menominee, Mich.....	37	7	0	1	53	30	44	61
Milwaukee, Wis.....	106	18	0	0	154	88	80	4
Muskegon, Mich.....	1,164	442	1	22	10,677	722	3,368	544
Muskegon, Ala.....	205	10	0	0	234	195	748	355
Nantucket, Mass.....	61	0	0	0	0	61	149	10
Nashville, Tenn.....	1,053	144	1	8	2,413	900	801	1,541
Natchez, Miss.....	54	2	0	0	48	52	118	3
New Bedford, Mass.....	113	23	0	0	577	90	121	247
New Bern, N. C.....	250	145	2	3	1,793	105	171	23
New Cumberland, Pa.....	190	2	0	1	188	221	221	3
New Haven, Conn.....	11	5	1	0	72	6	83	83
New London, Conn.....	197	141	1	1	1,687	56	56	100
Newport, Ark.....	68	2	0	0	28	66	83	66
Newport, R. I.....	49	0	0	0	0	49	87	18
Newport, Ore.....	147	66	2	0	854	81	70	107
New York (East Nineteenth Street)	7,916	89	0	5	2,377	7,847	31,578	167
Nome, Alaska.....	17	0	0	0	0	8	12	278
Norfolk, Va.....	9	1	0	0	20	3,609	5,176	3,459
Paducah, Ky.....	3,706	74	0	0	937	1,209	1,209	1,215
Panama, Fla.....	544	7	1	3	5,901	294	372	2,225
Pensacola, Fla.....	503	290	7	21	5,901	294	372	2,225
Perth Amboy, N. J.....	426	51	2	0	629	375	296	356

TABLE II.—*Transactions at Marine and Public Health Service Hospitals, District Headquarters, etc.—Continued.*

Location.	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
SECOND, THIRD, AND FOURTH CLASS STATIONS.								
Philadelphia, Pa.	9,801	1,239	33	45	21,995	8,562	17,655	2,928
Ponce, P. R.	71	20	0	2	311	51	165	10
Port Angeles, Wash.	61	4	4	0	62	57	84	12
Port Arthur, Tex.	488	84	3	1	653	404	907	102
Port Huron, Mich.	379	32	0	0	736	347	925	377
Portland, Oreg.	3,745	658	12	45	14,034	3,087	4,719	3,994
Portsmouth, N. H.	6	1	0	0	1	5	10	2
Providence, R. I.	1,033	323	10	13	6,299	710	1,329	1,884
Provincetown, Mass.	63	0	0	0	0	63	195	36
Richmond, Va.	599	162	4	10	3,151	437	783	865
Rockland, Me.	205	14	1	0	100	191	359	167
Saginaw, Mich.	522	38	1	4	1,068	484	547	728
San Diego, Calif.	1,702	189	8	25	5,765	1,513	2,383	432
Sandusky, Ohio.	28	5	0	1	104	23	29	104
Sault Ste. Marie, Mich.	189	102	3	10	1,379	87	212	158
Seattle, Wash.	4,321	645	14	17	7,259	3,676	6,345	6,367
Seward, Alaska.	48	0	0	0	0	48	76	2
Sheboygan, Wis.	28	14	0	0	129	14	20	237
Solomons, Md.	155	5	1	0	49	150	172	0
South Amboy, N. J.	422	0	0	0	0	422	638	82
Superior, Wis.	245	44	2	3	628	201	355	237
Tacoma, Wash.	317	120	2	5	1,365	197	373	72
Tampa, Fla.	266	87	1	3	1,044	179	183	301
Toledo, Ohio.	1,184	184	13	13	3,117	1,000	1,675	3,448
Unalak, Alaska.	14	3	3	0	37	11	12	0
Valdez, Alaska.	10	0	0	0	2	10	11	0
Vicksburg, Miss.	293	92	2	4	1,200	201	283	128
Washington, D. C.	43	10	0	0	53	33	50	73
Wilmington, N. C.	343	68	0	1	797	275	350	224
United States Coast Guard vessels.	969	0	0	0	0	969	1,170	3,144
Keepers and surfmen, United States Coast Guard.	2,865	0	0	0	0	2,865	8,503	90
Quarantine stations.	8,564	168	0	5	2,393	8,396	33,217	22
Total.	80,533	11,558	186	461	187,485	68,975	159,098	70,062

NOTE.—Columns (a)–(g) inclusive, Table II, are compiled from monthly reports; column (h), from annual reports.

TABLE II A.—Relief furnished at Marine and U. S. Public Health Service Hospitals, District Headquarters,¹ and other Relief Stations,² fiscal year 1920, according to beneficiary.

Beneficiary.	Class of stations.	Total number of patients treated.	Total number treated in hospital.	Died.	Remain- ing in hospital June 30, 1920.	Number of days' relief in hospital.	Number patients furnished office relief.	Number of times relief was furnished.	Number persons physically examined, including pilots.
Grand total.....	All.....	389,943	119,047	1,802	19,813	4,151,238	270,896	649,216	513,293
War Risk Insurance.....	Marine hospitals.....	26,021	13,475	148	853	311,173	12,516	29,208	13,929
	U. S. Public Health Service hospitals.....	50,360	30,247	397	5,526	20,113	61,027	61,027	13,988
	District headquarters ¹	168,131	37,411	391	10,784	1,536,689	130,720	327,546	378,680
	Other relief stations ²	28,646	5,771	69	309	113,386	22,875	32,104	38,716
	Total.....	273,158	86,904	1,005	17,472	3,349,415	186,254	449,885	445,293
American seamen.....	Marine hospitals.....	33,360	9,561	287	814	312,596	23,799	53,250	7,297
	U. S. Public Health Service hospitals.....	4,255	3,280	102	426	136,870	23,975	1,530	5,482
	District headquarters ¹	3,389	774	13	66	17,800	2,615	4,035	949
	Other relief stations ²	29,700	4,978	137	202	67,770	24,722	58,091	8,219
	Total.....	70,704	18,593	539	1,508	535,026	52,111	117,506	21,947
Foreign seamen.....	Marine hospitals.....	973	816	11	39	20,315	157	183	530
	U. S. Public Health Service hospitals.....	69	57	1	5	2,321	12	16	1,293
	District headquarters ¹	87	16	0	1	2,406	71	181	1,363
	Other relief stations ²	597	160	1	4	2,518	437	1,565	1,363
	Total.....	1,726	1,049	13	49	25,560	677	1,945	3,233
U. S. Army.....	Marine hospitals.....	117	57	2	2	1,299	90	102	24
	U. S. Public Health Service hospitals.....	280	216	4	4	4,006	64	119	26
	District headquarters ¹	45	7	0	0	80	38	160	5
	Other relief stations ²	113	17	0	2	210	96	203	17
	Total.....	585	297	6	8	5,625	288	646	72
U. S. Army Engineers.....	Marine hospitals.....	363	136	3	3	2,681	227	519	0
	U. S. Public Health Service hospitals.....	136	70	2	9	3,497	66	106	0
	District headquarters ¹	41	3	0	0	36	36	66	0
	Other relief stations ²	644	113	2	1	1,689	529	1,219	0
	Total.....	1,184	326	7	13	7,932	888	1,910	0

¹ See note (1), Table II, p. 279.² See note (2), Table II, p. 279.

TABLE II A.—*Relief furnished at Marine and U. S. Public Health Service Hospitals, District Headquarters,¹ and other Relief Stations,² fiscal year, 1920, according to beneficiary—Continued.*

Beneficiary.	Class of stations.	Total number of patients treated.	Total number treated in hospital.	Died.	Remain- ing in hospital June 30, 1920.	Number of days' relief in hospital.	Number patients furnished office relief.	Number of times office relief was furnished.	Number persons examined physically, including pilots.
U. S. Navy.	Marine hospitals.	202	160	0	1	2, 631	42	126	243
	U. S. Public Health Service hospitals.	130	110	11	22	4, 019	20	43	28
	District Headquarters ¹ .	9	3	0	0	32	6	22	25
	Other relief stations ² .	93	29	0	0	448	64	152	206
	Total.	434	302	11	23	7, 130	132	343	402
Coast Guard.	Marine hospitals.	2, 903	1, 040	6	69	25, 220	1, 863	3, 743	1, 602
	U. S. Public Health Service hospitals.	439	273	1	44	13, 474	166	282	380
	District headquarters ¹ .	105	4	0	0	110	101	160	0
	Other relief stations ² .	4, 594	390	1	4	4, 695	4, 204	11, 486	1, 816
	Total.	8, 041	1, 707	8	117	43, 499	6, 334	15, 671	3, 798
U. S. Public Health Service.	Marine hospitals.	193	126	3	10	2, 131	67	149	34
	U. S. Public Health Service hospitals.	602	389	9	35	6, 017	213	456	208
	District headquarters ¹ .	23	9	0	0	125	14	28	4
	Other relief stations ² .	67	11	1	0	187	56	78	4
	Total.	885	535	12	45	8, 460	350	711	249
Lighthouse Service.	Marine hospitals.	418	116	2	6	3, 425	302	592	54
	U. S. Public Health Service hospitals.	15	11	1	3	295	4	7	2
	District headquarters ¹ .	49	15	1	0	336	34	53	8
	Other relief stations ² .	432	71	1	2	817	361	680	99
	Total.	914	213	5	11	4, 873	701	1, 332	153
Coast and Geodetic Service.	Marine hospitals.	319	64	4	1	1, 154	255	323	264
	U. S. Public Health Service hospitals.	13	3	0	1	55	10	14	24
	District headquarters ¹ .	13	2	0	1	91	11	16	9
	Other relief stations ² .	231	41	0	3	336	190	287	356
	Total.	576	110	4	6	1, 636	466	640	653

Employees' compensation Commission	3,236 4,651 4,668 4,623 12,978	933 1,924 90 324 2,371	6 26 2 5 39	59 62 3 20 144	22,254 23,882 1,448 6,099 53,683	2,303 3,627 3,378 4,299 10,607	5,363 10,321 1,298 10,512 27,494	279 1,604 413 743 3,039
Mississippi River Commission	566 48 18 176 808	168 25 0 29 222	5 1 0 0 6	7 6 0 1 14	2,597 2,994 0 349 3,940	398 23 18 147 586	784 45 56 392 1,277	5 0 0 159 164
Federal Board Vocational Education	1,543 1,331 197 1,588 4,659	102 151 19 111 383	0 1 1 1 3	18 3 1 10 399	1,154 2,619 8 963 4,991	1,441 1,180 178 1,477 4,276	2,310 2,698 1,779 2,420 7,517	332 585 380 1,597
Immigration	0 5,573 0 0 5,573	0 5,564 0 0 5,564	0 128 0 0 128	0 314 0 0 314	0 84,812 0 0 84,812	0 9 0 0 9	0 15 0 0 15	207 17 45 6,099 6,362
Canadian soldiers	61 363 6 70 500	43 158 2 38 211	3 4 1 1 9	2 23 1 3 28	1,031 4,151 77 1,195 6,454	18 205 4 32 259	85 311 9 52 487	11 19 1 62 93
Other allied soldiers	21 65 6 8 94	17 35 0 4 56	0 0 0 0 0	4 7 0 1 12	363 762 0 44 1,169	4 30 0 4 38	7 60 0 10 77	2 0 0 0 2
Miscellaneous (not classified)	3,809 823 280 2,212 7,124	19 56 30 69 174	4 2 0 1 7	6 8 0 2 10	128 5,423 469 1,113 7,133	3,790 767 259 2,113 6,950	16,542 801 268 4,197 21,768	5,783 12,373 456 7,645 26,236

¹ See note (1), Table II, p. 279.

² See note (2), Table II, p. 279.

NOTE.—Physical examinations in Table II A compiled from annual reports; other information from monthly reports.

TABLE III.—Total number of hospital relief days furnished by the United States Public Health Service to each class of beneficiaries, by months, during the fiscal year, 1920.

Beneficiaries.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
War Risk Insurance.....	108,520	139,974	157,895	188,120	222,558	242,827	314,239	318,166	377,490	376,917	433,138	469,571	3,349,415
American seamen.....	36,177	36,624	38,645	43,400	43,154	47,729	49,580	48,549	53,177	43,640	46,244	48,127	535,026
Foreign seamen.....	1,999	1,656	2,113	1,859	2,566	2,879	3,016	3,032	2,047	1,618	1,302	1,453	25,560
U. S. Army.....	467	691	544	445	293	441	1,662	261	249	213	189	220	5,625
U. S. Army Engineers.....	535	584	494	578	494	585	664	652	796	813	889	853	7,932
U. S. Navy.....	563	503	533	664	326	455	802	627	637	640	604	756	7,130
Coast Guard.....	2,194	2,838	2,870	3,152	3,065	3,557	4,439	5,044	5,035	3,986	3,899	3,420	43,499
U. S. Public Health Service.....	441	214	353	380	361	463	945	1,214	1,102	1,054	872	1,251	8,460
Lighthouse Service.....	41	460	480	403	425	405	369	409	450	274	331	426	4,873
Coast and Geodetic Survey.....	51	203	139	130	35	11	69	173	157	173	244	231	1,636
Employees Compensation.....	3,147	3,093	4,131	4,204	4,347	4,492	4,801	4,330	4,625	4,928	4,963	5,312	53,683
Mississippi River Commission.....	209	232	235	218	237	175	363	625	381	323	439	503	3,940
Federal Board for Vocational Training.....	24	5	13	10	96	408	342	763	947	787	705	891	4,991
Immigration.....	196	419	2,732	5,883	6,320	7,674	11,587	10,316	10,923	9,326	9,062	10,314	84,812
Canadian soldiers.....	0	100	191	304	351	679	1,019	685	792	655	754	924	6,454
Other allied soldiers.....	0	0	54	54	20	32	74	32	114	209	265	286	1,169
Miscellaneous.....	42	24	349	303	651	455	698	1,553	945	821	713	579	7,133
Total.....	154,806	188,430	211,851	250,117	285,259	313,286	394,639	396,951	459,887	446,377	504,613	545,122	4,151,338

TABLE IV.—Total number of out-patient treatments furnished by the United States Public Health Service to each class of beneficiaries, by months, during the fiscal year, 1920.

Beneficiaries.	July.	August.	Septem-ber.	October.	Novem-ber.	Decem-ber.	January.	Feb-ruary.	March.	April.	May.	June.	Total.
War Risk Insurance.....	3,659	5,825	9,481	24,728	27,512	29,921	40,282	44,356	45,642	56,116	74,700	87,063	449,885
American seamen.....	11,737	9,585	9,235	9,700	8,667	9,688	9,981	8,776	10,362	9,153	10,016	10,536	117,506
Foreign seamen.....	308	50	153	148	97	159	227	137	73	167	223	203	1,945
U. S. Army.....	48	57	84	31	46	122	64	27	97	37	92	91	646
U. S. Army Engineers.....	174	243	190	191	191	181	131	100	126	104	132	147	1,910
U. S. Navy.....	50	50	46	31	9	9	19	29	23	31	27	19	343
Coast Guard.....	1,125	1,249	1,367	1,579	1,389	1,396	1,578	1,661	1,639	917	900	871	15,671
U. S. Public Health Service.....	1	8	2	39	20	5	40	114	124	121	78	159	711
Lighthouse Service.....	103	93	106	92	124	100	111	105	93	104	211	90	1,332
Coast and Geodetic Survey.....	63	110	71	46	99	53	41	23	12	29	58	35	640
Employees' Compensation Commission.....	1,230	1,226	2,143	2,230	2,136	2,243	2,092	1,865	2,949	3,034	3,216	3,130	27,494
Mississippi River Commission.....	157	110	88	79	97	86	121	142	102	60	47	188	1,277
Federal Board for Vocational Training.....	7	2	8	20	105	226	549	557	1,179	1,906	1,479	1,479	7,517
Immigration.....	0	0	0	0	0	0	0	0	2	3	4	6	15
Canadian soldiers.....	0	1	14	2	17	22	23	17	21	65	77	228	487
Foreign soldiers.....	0	0	0	0	0	0	0	0	11	12	22	32	77
Miscellaneous.....	1,189	1,942	3,375	1,523	1,300	1,280	1,886	1,983	1,936	1,737	1,863	1,746	21,760
Total.....	19,911	20,561	26,313	40,439	41,809	45,391	57,145	59,892	61,391	73,596	93,145	106,023	649,216

TABLE V.—Total number of physical examinations¹ furnished by the United States Public Health Service to each class of beneficiaries, by months, during the fiscal year, 1920.

Beneficiaries.	July.	August.	Septem-ber.	October.	Novem-ber.	Decem-ber.	January.	Feb-ruary.	March.	April.	May.	June.	Total.
War Risk Insurance.....	9,678	12,025	16,045	20,343	23,235	25,750	34,596	26,642	39,770	46,401	47,153	55,014	356,652
American seamen.....	2,179	2,476	2,357	2,103	1,712	1,778	1,894	1,719	2,194	2,504	2,624	2,710	26,250
Foreign seamen.....	267	434	241	202	1,179	263	258	205	13	237	260	336	3,037
U. S. Army.....	29	92	5	6	4	4	5	4	13	6	10	4	182
U. S. Army Engineers.....	3	2	0	1	2	0	0	0	1	1	1	2	15
U. S. Navy.....	2	8	4	3	5	2	14	2	6	2	15	3	66
Coast Guard.....	649	640	515	497	365	428	492	493	442	419	361	469	5,770
U. S. Public Health Service.....	29	17	89	43	32	10	28	15	36	22	17	17	355
Lighthouse Service.....	13	13	19	8	16	11	10	37	16	18	9	9	179
Coast and Geodetic Survey.....	59	86	46	66	86	54	53	6	73	50	70	33	682
Employees' Compensation Commission.....	242	170	156	451	342	450	723	703	1,080	1,098	1,494	1,070	7,979
Mississippi River Commission.....	5	0	12	26	11	16	36	11	12	8	12	15	164
Federal Board for Vocational Training.....	1	23	2	8	65	159	140	45	189	156	140	1,264	2,191
Immigration.....	121	128	170	80	111	37	52	0	5	24	113	21	857
Canadian soldiers.....	1	0	0	0	7	5	4	0	5	5	2	4	33
Other allied soldiers.....	0	0	0	0	0	0	1	0	0	1	.....	.....	2
Miscellaneous.....	403	446	643	210	381	300	321	282	169	444	458	644	4,701
Total.....	13,680	16,560	20,304	24,047	26,553	29,267	38,627	30,164	44,221	51,398	52,739	61,615	409,175

¹ Monthly Reports for Physical Examinations Incomplete. See Totals Table II.

DIVISION OF PERSONNEL AND ACCOUNTS.

The Division of Personnel and Accounts has been required to meet a large part of the burden thrown on the service by the examination and treatment of beneficiaries of the Bureau of War Risk Insurance. The service is the principal agency in affording this relief, and the expenses for this purpose have risen to large proportions. This has necessitated securing additional personnel, not only professional and scientific, but also attendants for duty in the hospitals and in connection with the supervisors' offices. This has not only increased markedly the work of the personnel section but also that relating to accounts. In order to perform this work, it has been necessary to increase the number of clerks from 11 to 37 in order to keep the work of the division current.

The enlarged activities of the Hospital Division reflect upon this division. Any increase in the work of that division is intimately interwoven with the Division of Personnel and Accounts, as with the increase in the number of hospitals and offices for the examination of beneficiaries increased personnel of the various classes becomes necessary.

In addition to the regular corps officers it has been necessary to commission and place on active duty 483 reserve officers, the latter being used exclusively in the hospitals operated by the service and the offices under the district supervisor for the examination and hospitalization of beneficiaries of the Bureau of War Risk Insurance.

The necessity of promptly paying personnel, especially at stations remote from Washington, early became apparent, and consequently a certain part of the work of the accounting section was decentralized and special disbursing officers have been appointed to make payment of salaries in large centers not only of the personnel of hospitals but also those employed in the district supervisors' offices.

It has also become necessary to appoint a large number of attending specialists to provide skilled treatment of a special nature in the hospitals of the service. The number of acting assistant surgeons has also been materially increased, so that adequate medical service would be available for the examination and treatment of beneficiaries in all parts of the country. These officers have been increased from 701 at the beginning of the fiscal year to 1,511 at the close.

Although the work in this division has increased more than 100 per cent, it has been possible to keep it current with the detail of one assistant medical officer and the requisite enlargement of the clerical force.

COMMISSIONED MEDICAL OFFICERS.

There has occurred during the fiscal year a reduction in the number of commissioned officers of the regular corps due to resignations. At the commencement of the fiscal year the corps consisted of the

Surgeon General, 1 Assistant Surgeon General at large, 16 senior surgeons, 70 surgeons, 60 passed assistant surgeons, and 70 assistant surgeons.

The changes that have resulted in the different grades are as follows: Two senior surgeons were promoted to the grade of Assistant Surgeon General at Large; 1 surgeon, who was an ex-Surgeon General, was promoted to the grade of Assistant Surgeon General at Large; 2 surgeons were promoted to the grade of senior surgeon; 4 passed assistant surgeons were promoted to the grade of surgeon; 10 assistant surgeons promoted to the grade of passed assistant surgeon; and 4 candidates who passed the examination required by laws and regulations of the service were commissioned assistant surgeons. On account of physical disability 1 Assistant Surgeon General at Large was placed on waiting orders and 4 senior surgeons, 2 surgeons, and 2 passed assistant surgeons continued on waiting orders.

These changes show the regular commissioned Medical Corps at the close of the fiscal year to consist of the Surgeon General, 4 Assistant Surgeons General at Large, 16 senior surgeons, 72 surgeons, 71 passed assistant surgeons, and 36 assistant surgeons. Two senior surgeons and 5 surgeons were upon detail in the bureau as Assistant Surgeons General, in accordance with the act approved July 1, 1902.

RESERVE MEDICAL OFFICERS.

Owing to the enlarged activities of the service, especially that incident to the examination and treatment of beneficiaries of the Bureau of War Risk Insurance, it has become necessary to increase the number of reserve medical officers on active duty. At the commencement of the fiscal year there were 222 serving in this capacity; at the close of the fiscal year there were 483—an increase of 261. These officers were serving under commissions in the following grades: One Assistant Surgeon General, detailed as Chief Medical Officer, Federal Board for Vocational Education; 13 senior surgeons, 130 surgeons, 271 passed assistant surgeons, and 68 assistant surgeons.

The provisions of law which make the reserve personnel available for duty in the hospitals of the service and in offices connected with the examination and treatment of beneficiaries of the Bureau of War Risk Insurance has enabled the service to meet its added responsibilities in providing care for this large class of patients. It is evident that the small regular corps which suffered reduction during the year on account of the resignation of officers to accept more lucrative positions in civil life could not have carried out the various activities that fall within the province of the Public Health Service.

ATTENDING SPECIALISTS.

In the administration of hospitals and supervisors' offices it soon became apparent that skilled treatment and advice in certain specialties was absolutely necessary in order to afford the most scientific and up-to-date treatment to certain beneficiaries suffering from diseases of an obscure or grave character. In order to meet this demand and to make the hospitals operated by the Public Health Service second to none, and thorough in advice and treatment of its patients, there have been appointed 807 physicians as attending specialists. These

physicians have accepted appointment on a part-time basis and have rendered valuable service, being animated by a desire to render aid to ex-service men, as the compensation given is nominal and is certainly not an incentive for these men to serve.

The attending specialists connected with the supervisors' offices are serving in an advisory capacity in the formulation of policies to be pursued in the examination of a certain class of ex-service men that require special consideration.

ACTING ASSISTANT SURGEONS.

The number of acting assistant surgeons has increased from 701 at the beginning of the fiscal year to 1,511 at the close. The increase is due to the opening of United States Public Health Service hospitals for the care of beneficiaries of the Bureau of War Risk Insurance; also to the establishment and expansion of 18 districts, each under a supervisor, covering the United States and insular possessions, for the examination and care of these beneficiaries. Acting assistant surgeons are appointed locally when there is a sufficient number of beneficiaries in a locality to warrant such appointments.

In addition to this number, a large number of physicians have been appointed as designated examiners on a fee basis in order that there will always be available some physician in every locality for the examination and treatment of ex-service men.

COLLABORATING EPIDEMIOLOGISTS.

On account of the importance of securing early and accurate reports of diseases prevailing throughout the United States, the number of epidemiologists have been materially increased. Most of these epidemiologists are serving under a nominal compensation of \$1 per annum and are rendering valuable service to the bureau by reports of communicable diseases prevailing in their district. These epidemiologists are health officers of cities and counties, and the number now rendering this service are 32 collaborating epidemiologists and 2,803 assistant collaborating epidemiologists.

Assignments.—Among other assignments of commissioned officers during the fiscal year were the following: Twenty were assigned to exclusive immigration duty, their services being supplemented by employment of acting assistant surgeons; 4 to the quarantine service of the Philippine Islands; 1 to a vessel of the Coast Guard; 23 to the quarantine stations in the continental United States, Porto Rico, the Hawaiian Islands, and the Virgin Islands; 3 to duty in foreign countries to prevent the introduction of epidemic diseases into the United States; and 1 commissioned medical officer was continued on duty under the Governor of the Panama Canal as chief quarantine officer.

HYGIENIC LABORATORY.

During the fiscal year the amount of work performed in the hygienic laboratory has materially increased on account of testing arsplenamine for potency and reliability and also certain studies have been carried out in relation to the Public Health Service, especially that on pneumonia.

At the close of the fiscal year there were on duty in the hygienic laboratory, in addition to the director and assistant director, 3 chiefs of divisions, 4 surgeons, 5 passed assistant surgeons, 2 assistant surgeons, 2 pharmacists, 2 professors, 3 technical assistants, 2 physiologists, 3 special experts, 2 pharmacologists, 1 assistant pharmacologist, 1 scientific assistant, 1 chemist, 1 chemical laboratorian, 2 bacteriologists, 3 sanitary bacteriologists, 1 artist, 13 other technical employees, 50 attendants and other employees.

FIELD INVESTIGATIONS OF PUBLIC HEALTH.

In addition to the regular important activities which are continued from year to year, it became necessary to do some intensive work toward the eradication of plague in several centers where the disease appeared. This necessitated an increase in the medical and other personnel, which is shown in the tabulated statement, under the proper headings. There is also included a statement showing the various activities carried out in accordance with the act of Congress approved August 14, 1912, which authorizes the service to study and investigate the diseases of man and conditions influencing the propagation and spread thereof.

STUDIES OF RURAL SANITATION.

(Headquarters, Washington, D. C.)

<i>Chattanooga, Tenn.</i>	<i>Huntsville, Ala.</i>
Field Agent E. R. Hochstetter.	Field Agent Carl A. Grote.
<i>Columbus, Ga.</i>	<i>Jasper, Ala.</i>
Field Agent H. B. Fitzmorris.	Field Agent A. M. Waldrop.
<i>Fayetteville, N. C.</i>	<i>Joplin, Mo.</i>
Scientific Asst. W. C. Verdery (health officer of Cumberland County).	Asst. Surg. Thomas Parran, Jr.
<i>Florence, Ala.</i>	Acting Asst. Surg. J. C. Montgomery.
Field Agent W. H. Abernathy.	Acting Asst. Surg. Guy D. Calloway.
<i>Gulfport, Miss.</i>	Acting Asst. Surg. Fred E. Deal.
Scientific Asst. D. I. Williams.	Scientific Asst. H. S. Lucas.
<i>Lafayette, Ga.</i>	<i>Talladega, Ala.</i>
Field Agent John A. Johnston.	Field Agent W. E. Burt.
<i>Martinsville, Va.</i>	<i>Tarboro, N. C.</i>
Field Agent Edgar C. Harper.	Field Agent C. L. Outland.
<i>Richmond, Va. (Virginia at large).</i>	<i>Woodstock, Vt.</i>
Passed Asst. Surg. W. F. Draper.	Field Agent C. W. Kidder.
Asst. Surg. H. S. Mustard.	<i>Rural sanitation supervision.</i>
Scientific Asst. George S. Bote.	Surg. L. L. Lumsden, in charge of studies of rural sanitation.
Scientific Asst. E. C. Story.	Passed Asst. Surg. K. E. Miller.
Asst. Epidemiologist John W. Cox.	Associate Epidemiologist C. C. Applewhite.
	Associate Epidemiologist William K. Sharp, jr.
	Acting Asst. Surg. Fred T. Foard.

MALARIA.

(Headquarters, Memphis, Tenn.)

Surg. L. D. Fricks (in charge).	<i>Columbia, S. C.</i>
<i>Albany, Ga.</i>	Associate Sanitary Engineer L. M. Fisher.
Associate Sanitary Engineer A. F. Allen.	<i>Congarce, S. C.</i>
<i>Atlanta, Ga.</i>	Technical Asst. T. B. Hayne.
Asst. Sanitary Engineer H. N. Old.	<i>Jackson, Miss.</i>
<i>Baton Rouge, La.</i>	Asst. Sanitary Engineer W. H. W. Komp.
Asst. Sanitary Engineer Frank R. Shaw.	<i>Jacksonville, Fla.</i>
<i>Austin, Tex.</i>	Asst. Sanitary Engineer J. G. Foster.
Asst. Sanitary Engineer W. E. Hard- enburg.	<i>Little Rock, Ark.</i>
<i>Camilla, Ga.</i>	Passed Asst. Surg. F. M. Faget.
Acting Asst. Surg. C. P. Coogle.	<i>Memphis, Tenn.</i>
<i>Chico, Calif.</i>	Surg. L. D. Fricks (in charge). Special Expert N. A. Barber.
Special Expert W. C. Purdy.	Senior Sanitary Engineer J. A. Le Prince.
Plankton Asst. Chas. K. Price.	Associate Sanitary Engineer W. G. Stromquist.
<i>Montgomery, Ala.</i>	Technical Asst. Bruce Mayne.
Asst. Sanitary Engineer J. C. Carter.	Technical Asst. J. H. Mercer.
<i>New Orleans, La. (State of Louisiana.)</i>	Pharmacist L. G. Smith.
Asst. Sanitary Engineer H. C. Wood- fall.	Collaborating Biologist C. W. Metz (with Carnegie Institute).
Asst. Sanitary Engineer L. C. Kenert.	<i>Savannah, Ga.</i>
<i>Norfolk, Va.</i>	Special Expert W. A. Davis.
Epidemiologist T. H. D. Griffiths.	<i>Texarkana, Ark.</i>
<i>Raleigh, N. C.</i>	Associate Sanitary Engineer H. W. Van Hovenbert (on leave of absence for two years from Mar. 1, 1919).
Associate Sanitary Engineer A. W. Fuchs.	

MORBIDITY STATISTICS.

(Headquarters, Washington, D. C.)

Surg. W. H. Frost, in charge.	Statistical Expert Dean K. Brundage.
Statistician Edgar Sydenstricker.	

PELLAGRA.

(Headquarters, Hygienic Laboratory, Washington, D. C.)

Surg. Joseph Goldberger, in charge.	<i>Milledgeville, S. C.</i>
<i>Spartanburg, S. C.</i>	Asst. Surg. W. F. Tanner.
Passed Asst. Surg. G. A. Wheeler.	
Consulting Statistician Wilford I. King.	
Scientific Asst. Lindsay Swofford.	

PUBLIC HEALTH ADMINISTRATION.

Passed Asst. Surg. C. E. Waller, State health officer, Albuquerque, N. Mex.
Epidemiologist F. E. Harrington, city health officer, Minneapolis, Minn.

Asst. Sanitary Engineer L. C. Frank, city health officer, Dallas, Tex.

CHILD AND ORAL HYGIENE.

(Headquarters, Washington, D. C.)

Asst. Surg. Gen. (R.) T. Clark, in charge.

State of Mississippi, Jackson.

Passed Asst. Surg. L. O. Weldon.

Acting Asst. Surg. Edith B. Lowry.

Acting Asst. Surg. Ella Oppenheimer.

State of Missouri, Jefferson City.

State of Delaware, Wilmington.

Passed Asst. Surg. C. P. Knight.

Acting Asst. Surg. Gilbert S. Osincup.

Acting Asst. Surg. Elizabeth Reed.

Acting Asst. Surg. Harry B. Butler.

Acting Asst. Surg. Viola Russell.

State of Georgia, Atlanta.

State of Oregon.

Acting Asst. Surg. Lydia A. De Vilbiss.

Acting Asst. Surg. Chester L. Carlisle.

State of Maryland, Baltimore.

Consultants in child hygiene.

Acting Asst. Surg. E. Blanche Sterling.

Dr. S. Josephine Baker, New York, N. Y.

State of Massachusetts, Boston.

Dr. McClintock Hamill, Philadelphia, Pa.

Acting Asst. Surg. R. W. Curtis.

Dr. L. Emmett Holt, New York, N. Y.

Acting Asst. Surg. Mary Wright.

Dr. Walter McN. Miller, St. Louis, Mo.

Bacteriologist Edith R. Dunn.

Dr. J. P. Sedgwick, Minneapolis, Minn.

Dr. Fritz B. Talbot, Boston, Mass.

SEWAGE DISPOSAL.

(Headquarters, Hygienic Laboratory.)

Wilmington, N. C.

Consultants on Sewage Disposal Board—Continued.

Prof. Charles W. Stiles, in charge.

Associate Sanitary Engineer H. R. Crohurst.

Consulting Hygienist Edwin O. Jordon, Chicago, Ill.

Bacteriologist C. L. Peau.

Consulting Hygienist W. S. Rankin, Raleigh, N. C.

Consultants on Sewage Disposal Board.

Consultant E. B. Phelps, New York, N. Y.

Consulting Engineer George C. Whipple, Cambridge, Mass.

Consultant Victor C. Vaughan, Ann Arbor, Mich.

STREAM POLLUTION.

(Headquarters, Cincinnati, Ohio.)

Washington, D. C.

Cincinnati, Ohio—Continued.

Surg. W. H. Frost in charge.

Chemist Michael J. Blew.

Cincinnati, Ohio.

Asst. Sanitary Engineer H. H. Wagenhals.

Passed Asst. Surg. Paul Preble.

Sanitary Bacteriologist E. J. Theriault.

Associate Sanitary Engineer J. K. Hoskins.

Pharmacist F. J. Herty.

Associate Sanitary Engineer H. B. Hommon.

Consultants in Stream Pollution.

Associate Sanitary Engineer H. W. Streeter.

Consultant George W. Fuller.
Consulting Sanitary Engineer Allen Hazen.

Associate Sanitary Engineer R. E. Tarbett.

Consulting Engineer Caleb M. Saville.
Consultant F. W. Rose.

Asst. Sanitary Engineer H. R. Fullerton.

INDUSTRIAL SANITATION.

(Headquarters, Washington, D. C.)

Scientific Asst. B. J. Newman in temporary charge.

Passed Asst. Surg. R. R. Spencer (temporarily, New Orleans, La., plague eradication).

Asst. Surg. R. C. William (temporarily, New Orleans, La., plague eradication).

Pharmacist William G. Beucler, executive officer.

Acting Asst. Surg. O. M. Spencer.

Acting Asst. Surg. Thomas B. Jones.

Statistician Frank N. Phillips.

Acting Asst. Surg. W. J. McConnell.

Acting Asst. Surg. H. B. Wood.

Acting Asst. Surg. A. W. Bowker.

Asst. Chemist Harry W. Houghton.

Technical Translator Ferrand Dumont.

Scientific Asst. James G. Melliush.

Consulting Hygienist W. J. Curry.

Scientific Asst. Norris P. Bryan.

Acting Asst. Surg. Frank L. Rector.

Acting Asst. Surg. J. Arthur Turner.

Scientific Asst. Leonard Greenburg.

Scientific Asst. C. E. McElroy.

Scientific Asst. Clarence A. Ward.

Scientific Asst. Goban Stair.

Acting Asst. Surg. Edward O. Dyer.

Acting Asst. Surg. Eloise Meek.

Asst. Sanitary Chemist Albert B. Hastings.

Scientific Asst. Forrest E. Deeds.

Scientific Asst. E. M. Martin.

Part-time personnel.

Consulting Hygienist Roscoe P. Albaugh.

Consulting Hygienist David L. Edsall.
Physiological Chemist P. Sargent Florence.

Consulting Hygienist Otto P. Geier.

Special Expert Josephine Goldmark.

Consulting Hygienist Emory R. Hayhurst.

Scientific Asst. Mary D. Hopkins.

Acting Asst. Surg. Henry H. Kessler.

Consulting Physiologist Frederic S. Lee.

Scientific Asst. E. G. Martin.

Acting Asst. Surg. John M. Pannullo.

Field Director Francis D. Patterson.

Consulting Hygienist R. G. Perkins.

Acting Asst. Surg. Andrew H. Ryan.

Consulting Hygienist C. D. Selby.

Consulting Hygienist Alfred Stengel.

Consulting Hygienist W. Gilman Thompson.

Consulting Hygienist C. E. A. Winslow.

TRACHOMA.

Louisville, Ky. (headquarters).

Surg. John McMullen, in charge.

Acting Asst. Surg. James E. Smith.

Greenville, Ky.

Acting Asst. Surg. Joe C. Johnston.

Jackson, Ky.

Acting Asst. Surg. . . J. Ellis.

La Moure, N. Dak.

Acting Asst. Surg. Clarence E. Downs.

Pikeville, Ky.

Acting Asst. Surg. Russell W. Raynor.

Acting Asst. Surg. J. Allen Eldridge.

Tazewell, Tenn.

Acting Asst. Surg. Joseph L. Goodwin.

SPECIAL STUDIES OF PELLAGRA.

(Headquarters, Pellagra Hospital, Spartanburg, S. C.)

Surg. Joseph Goldberger (in general charge hygienic laboratory).

Passed Asst. Surg. G. A. Wheeler (in immediate charge of hospital).

Acting Asst. Surg. Benjamin Manhoff.

Asst. Biochemist Paul R. Dawson.

Scientific Asst. George A. Decell.

BOTULISM.

Epidemiologist J. C. Geiger (special duty in California).

LEPROSY INVESTIGATIONS.

(Headquarters, Honolulu, Hawaii.)

Acting Asst. Surg. J. T. McDonald.

Chemist Ruth A. Wood.

PLAGUE ERADICATIVE MEASURES.

Florida.

Passed Asst. Surg. R. R. Spencer, care of State department of health, Pensacola, Fla.
 Acting Asst. Surg. Percy Ahrons.
 Asst. Sanitary Engineer Arthur L. Dopmeyer.

Louisiana.

Passed Asst. Surg. M. S. Lombard, 535 St. Charles Street, New Orleans.
 Passed Asst. Surg. C. L. Williams.
 Asst. Surg. R. C. Williams.
 Associate Sanitary Engineer A. F. Allen.
 Acting Asst. Surg. R. E. Bodet.
 Acting Asst. Surg. J. W. Rosenthal.

Texas (Beaumont).

Passed Asst. Surg. H. F. White, Beaumont, Tex.
 Passed Asst. Surg. C. M. Chapin.
 Asst. Surg. C. Armstrong (for instruction).
 Asst. Surg. M. V. Ziegler (for instruction).
 Acting Asst. Surg. Paul Eaton.
 Acting Asst. Surg. D. McMicken.
 Pharmacist G. W. Iltis.
 Associate Sanitary Engineer Edmund C. Sullivan.

California.

Asst. Surg. W. T. Harrison, 76 New Montgomery Street, San Francisco.

Washington.

Surg. Hugh DeValin, 416 Central Building, Seattle, Wash.

OFFICERS ASSIGNED TO DUTY IN FOLLOWING STATES AS EPIDEMIOLOGIC AIDS TO THE STATE HEALTH OFFICERS FOR THE PREVENTION OF THE INTERSTATE SPREAD OF DISEASE.

Arkansas.

Asst. Surg. R. E. Dyer, care of State health officer, Little Rock, Ark.

Massachusetts.

Passed Asst. Surg. L. L. Williams, jr., care of State health officer, Boston.

Georgia.

Passed Asst. Surg. W. S. Bean, care of State health officer, Atlanta, Ga.

New Jersey.

Asst. Surg. M. F. Haralson, care of State health officer, Trenton.

Indiana.

Asst. Surg. M. V. Ziegler, care of State health officer, Indianapolis, Ind.

Ohio.

Asst. Surg. C. Armstrong, care of State health officer, Columbus.

Louisiana.

Passed Asst. Surg. C. L. Williams, care of State health officer, New Orleans.

South Carolina.

Passed Asst. Surg. C. V. Akin, care of State health officer, Columbia.

Maryland.

Asst. Surg. R. B. Norment, care of State health officer, Baltimore.

Wisconsin.

Passed Asst. Surg. Robert Olesen, care of State health officer, Madison.

ENGINEERS ASSIGNED TO DUTY IN FOLLOWING STATES TO ASSIST THE STATE HEALTH OFFICER TO PROPERLY SUPERVISE WATER SUPPLIES USED IN INTERSTATE TRAFFIC.

Little Rock, Ark.

Assistant Sanitary Engineer L. D. Mars.

Lincoln, Nebr.

Assistant Sanitary Engineer Joel I. Connolly.

Louisville, Ky.

Assistant Sanitary Engineer Arthur E. Gorman.

Nashville, Tenn.

Associate Sanitary Engineer C. N. Harrub.

Jackson, Miss.

Assistant Sanitary Engineer H. A. Kroeze.

Washington, D. C. (Bureau.)

Assistant Sanitary Engineer Isador W. Mendelsohn.

ENGINEERS ASSIGNED TO ASSIST STATE HEALTH OFFICERS—continued.

New Orleans, La.

Associate Sanitary Engineer Sol Pincus.

Collaborating sanitary engineers.

W. G. Swendsen, Boise, Idaho.	J. W. Kellogg, Raleigh, N. C.
J. C. Diggs, Indianapolis, Ind.	A. E. McCoy, University, N. Dak.
Arthur P. Miller, Louisville, Ky.	E. L. Filby, Columbia, S. C.
Philip McGouldrick, Augusta, Me.	Charles P. Moat, Burlington, Vt.
Harold F. Gray, Santa Fe, N. Mex.	C. E. Dorisy, Seattle, Wash.

PREVENTION OF INTRODUCTION OF TYPHUS FEVER FROM MEXICO.

Passed Asst. Surg. R. M. Grimm, San Antonio, Tex.	Acting Asst. Surg. W. F. Woodall, Hidalgo, Tex.
Asst. Surg. J. W. Tappan, El Paso, Tex.	Acting Asst. Surg. G. D. Fairbanks, Brownsville, Tex.
Acting Asst. Surg. H. B. Ross, Del Rio, Tex.	Acting Asst. Surg. H. W. Purdy, Nogales, Ariz.
Acting Asst. Surg. G. W. Edgerton, Rio Grande City, Tex.	Acting Asst. Surg. B. C. Tarbell, Naco, Ariz.
Acting Asst. Surg. E. W. Adamson, Douglas, Ariz.	

PHARMACISTS.

Owing to the small number of pharmacists it became necessary with the enlargement of the activities to provide for the appointment of administrative assistants and material officers to supplement this small corps in the performance of duties of an administrative character. The new regulations contemplate merging the present corps of pharmacists into that of administrative assistants, with a readjustment of salaries which will provide for an increase over that now received by pharmacists.

At the beginning of the fiscal year there were on duty 47 pharmacists divided as follows: Pharmacists of the first class, 33; second class, 13; third class, 1. Two pharmacists of the first class died; 2 pharmacists of the first class and 1 of the second class resigned, leaving at the close of the fiscal year 42 pharmacists on duty, as follows: Pharmacists of the first class, 29; second class, 13.

HOSPITAL AND QUARANTINE ATTENDANTS.

At the beginning of the fiscal year 1,076 attendants were employed at the various marine hospitals, quarantine stations, and on epidemic duty, including 65 such employees on duty in the Philippine Islands. At the close of the fiscal year there were so employed including those engaged in activities incident to hospital construction, as follows:

Marine hospitals	1, 144
Quarantine (including Porto Rico and Hawaii)	580
Epidemic	607
Public Health Service hospitals	5, 327
War Risk districts	2, 379
Field investigations of public health	378
Philippine Islands	65
Hospital construction	746
Total	11, 226

Recapitulation.

Commissioned medical officers.....	200
Commissioned officers, reserve corps (active).....	483
Chiefs of divisions, Hygienic Laboratory.....	3
Advisory board, Hygienic Laboratory.....	5
Acting assistant surgeons:	
General service.....	382
Venereal clinics.....	79
U. S. Public Health and Marine hospitals.....	180
War Risk district and relief stations.....	870
Attending specialists.....	807
Collaborating epidemiologists.....	2, 832
Pharmacists.....	42
Sanitary engineers, scientific assistants, bacteriologists, and other scientific employees.....	178
Attendants.....	11, 226
Total.....	17, 287

BOARDS CONVENED.

Forty-seven boards were convened at various stations throughout the United States for the physical examination of officers of the Coast Guard and applicants for entrance therein, 2 for the physical examination of detained aliens, 10 for the examination of commissioned officers to determine their fitness for promotion to the next higher grades of the service, 7 for examination of applicants for appointment as assistant surgeons, 2 for the examination of pharmacists to determine their fitness for promotion to a higher grade, 2 to consider the possible utilization of certain hospital sites, 3 for the physical examination of employees of administration of War Risk districts, 1 to survey hospital equipment, 1 to effect a revision of the quarantine regulations, 1 for the revision of the general regulations of the service, and 1 to determine the eligibility of a commissioned officer of the service to be placed on waiting orders.

The bureau sanitary board has been convened in six sessions to pass upon reports of inspections of establishments engaged in the manufacture of vaccines, serums, toxins, etc., prior to recommending a license, and to pass upon advertised remedies and appliances to determine if said advertisements should be excluded from the mails.

DIVISION OF VENEREAL DISEASES.

During 1920 the work of venereal-disease control has been developed in accordance with the threefold program of medical, educational, and law-enforcement measures put into operation in 1919. The work of the State boards of health has been more thoroughly organized. They have taken over all of the detail and follow-up work and generally have assumed greater initiative. The work of the division has been to coordinate that of the different States and to help them solve their problems; to prepare educational material; to improve and standardize methods of diagnosis, treatment, and control of venereal diseases by studying and comparing the results of various methods now in operation; and to stimulate to greater activity, through special appeals, large groups of people in civic, social, commercial, and industrial fields.

FEDERAL AND STATE APPROPRIATIONS.

At the close of 1919, 46 States had received Chamberlain-Kahn funds. Two States only—Pennsylvania and Nevada—and the District of Columbia did not secure their allotment through failure to adopt the regulations promulgated by the Secretary of the Treasury. The \$87,831.42 for which these States failed to qualify in 1919 was added to the \$1,000,000 made available to the States in 1920, and the total, \$1,087,831.42, was apportioned to the States on a population basis.

To secure its entire allotment from Federal funds in 1920, it was necessary for each State to raise an equal amount, by legislative act or otherwise. At the close of 1920, 46 States have made appropriations entitling them to receive all or part of their Federal allotment. The District of Columbia, Nevada, and New Mexico only failed to secure any of the amount apportioned to them.

The table following shows the amount of the Federal allotment to States in 1920, the amount set aside by each State, and the unexpended balance of the Federal appropriation on June 30.

Allotment to States, July 1, 1919-June 30, 1920.

State.	Federal allotment available.	State legislative appropriation.	Otherwise set aside by States.	Federal allotment unexpended June 30, 1920.
United States.....	\$1,087,831.42	\$706,574.33	\$284,911.79	\$388,622.63
Alabama.....	25,288.99		25,283.99	
Arizona.....	2,417.06	2,250.00		1,252.08
Arkansas.....	18,622.30	17,118.74		12,683.87
California.....	28,121.23	25,800.00		2,214.72
Colorado.....	9,450.70	8,500.00	950.79	4,132.00
Connecticut.....	13,185.13	12,000.00		
Delaware.....	2,393.02	2,393.02		
District of Columbia.....	3,915.83			
Florida.....	8,901.84	8,901.84		5,095.28
Georgia.....	30,860.21	15,000.00		
Idaho.....	3,851.96		3,540.13	2,679.23
Illinois.....	66,692.24	66,692.24		
Indiana.....	31,945.49	29,368.20	2,579.29	4,347.10
Iowa.....	26,314.19	15,000.00		
Kansas.....	20,000.24	5,000.00	15,000.24	1,103.45
Kentucky.....	27,084.58	27,000.00	84.58	27,084.58
Louisiana.....	19,591.46	10,000.00	9,590.46	11,466.56
Maine.....	8,780.62	8,671.68		5,116.68
Maryland.....	15,321.11		14,651.96	9,476.47
Massachusetts.....	39,817.37		36,602.51	19,895.31
Michigan.....	33,238.23	33,238.23		7,547.45
Minnesota.....	24,551.10	24,551.10		5,460.17
Mississippi.....	21,255.94	20,000.00	1,255.94	19,002.42
Missouri.....	38,952.98		31,969.03	31,969.03
Montana.....	4,447.88	4,088.76	359.12	
Nebraska.....	14,101.28	12,962.75		
Nevada.....	968.40			
New Hampshire.....	5,092.72	4,681.54	300.00	2,272.49
New Jersey.....	30,009.17	27,586.22		
New Mexico.....	3,871.27			
New York.....	107,794.18	100,000.00	7,794.18	14,420.59
North Carolina.....	26,095.57	26,095.57		11,341.44
North Dakota.....	6,825.31	6,274.24		2,878.09
Ohio.....	56,384.66	25,000.00		12,080.16
Oregon.....	7,957.34		7,314.87	3,000.26
Oklahoma.....	19,600.53	19,600.53		
Pennsylvania.....	90,661.56		90,661.56	78,590.44
Rhode Island.....	6,417.90		6,000.00	6,000.00
South Carolina.....	17,923.88	17,923.88		
South Dakota.....	6,906.12	5,000.00		2,263.19
Tennessee.....	25,841.29	25,841.29		25,841.29
Texas.....	46,087.60	26,300.00	19,300.00	28,985.88
Utah.....	4,415.92	4,415.92		2,008.56
Vermont.....	1,210.19	3,000.00	1,210.19	3,912.84
Virginia.....	24,584.37	22,420.58	1,933.79	
Washington.....	13,507.25	12,500.00	1,007.25	4,508.86
West Virginia.....	14,443.18	7,000.00	5,900.00	6,184.19
Wisconsin.....	27,604.49	25,000.00		13,207.95
Wyoming.....	1,726.14		1,587.00	

The State legislative appropriations of \$706,574.33 plus the amounts otherwise set aside, \$284,911.79, making a total of 991,486.12, which, subtracted from the total Federal appropriation of \$1,087,831.42, leaves a balance of \$96,345.30 for which the States did not qualify. The appropriations carried by the Chamberlain-Kahn Act covered the years 1919 and 1920 only, making legislative action necessary to provide for 1921. An appropriation of \$450,000 has been made by Congress, and the lapsed balance of \$96,345.30 reappropriated, making a total of \$546,345.30 available to the States for 1921. This sum has been allotted as follows:

Alabama.....	\$12,700.97	Delaware.....	\$1,201.86
Arizona.....	1,213.93	District of Columbia.....	1,966.66
Arkansas.....	9,352.75	Florida.....	4,470.80
California.....	14,123.42	Georgia.....	15,499.03
Colorado.....	4,746.46	Idaho.....	1,934.13
Connecticut.....	6,622.02	Illinois.....	33,495.07

Indiana	\$16,044.09	North Dakota	\$3,427.90
Iowa	13,215.86	Ohio	28,318.26
Kansas	10,044.79	Oklahoma	9,844.94
Kentucky	13,602.78	Oregon	3,996.44
Louisiana	9,839.49	Pennsylvania	45,533.26
Maine	4,409.92	Rhode Island	3,223.28
Maryland	7,694.78	South Carolina	9,001.97
Massachusetts	19,997.61	South Dakota	3,468.48
Michigan	16,693.35	Tennessee	12,978.36
Minnesota	12,330.39	Texas	23,146.73
Mississippi	10,675.45	Utah	2,217.83
Missouri	19,563.49	Vermont	2,114.50
Montana	2,233.87	Virginia	12,246.65
Nebraska	7,082.14	Washington	6,783.79
Nevada	486.36	West Virginia	7,253.85
New Hampshire	2,557.74	Wisconsin	13,863.89
New Jersey	15,071.60	Wyoming	867.08
New Mexico	1,944.28		
New York	54,137.84	Total	546,345.30
North Carolina	13,106.06		

To secure its allotment for 1921 each State will have to raise an equal amount from local funds. It is hoped, however, that the State appropriations for 1921 will be large enough to offset the decrease in the Federal allotment so that the work begun may continue in volume and effectiveness. This will not be possible if State as well as Federal appropriations are decreased.

Complete data showing what States have qualified for their 1921 allotment are not available. Of the 34 States whose appropriations for 1920 were reported in 1919 the following provided for annual appropriations:

Florida	\$12,000.00	Vermont	\$3,000.00
Iowa	15,000.00	West Virginia	7,000.00
North Carolina	23,988.61		

The appropriations made by the following States covered the two years, 1920 and 1921:

Arizona	\$4,500.00	Nebraska	\$25,925.50
Arkansas	34,237.48	New Hampshire	9,363.08
California	51,800.00	North Dakota	12,548.48
Colorado	17,000.00	Oklahoma	86,000.00
Connecticut	24,000.00	South Dakota	10,000.00
Michigan	300,000.00	Utah	8,000.00
Minnesota	60,000.00	Washington	25,000.00
Montana	8,177.48	Wisconsin	50,000.00

This makes a total of 21 States which are already entitled to receive the 1921 allotment.

In addition to the appropriation for the States, Congress set aside \$200,000 to cover the expenses of the division for 1921.

DIVISION PERSONNEL.

Asst. Surg. Gen. C. C. Pierce has continued in charge of the Division of Venereal Diseases throughout the year, assisted by one commissioned officer and two section chiefs. Other members of the office

staff have been an administrative assistant, a nurse, 6 assistant directors of educational work, an abstractor and correspondent, an artist, a financial clerk, a statistician, library assistant, 2 file clerks, 11 stenographers, 3 clerks, 4 typists, a multigraph operator, and 4 messengers; a total personnel of 42.

The field personnel has consisted of the following: Seventy-one acting assistant surgeons, 13 scientific assistants, 14 regional consultants, 2 lecturers, and 2 stenographers; a total field personnel of 102.

MEDICAL MEASURES.

The medical activities in 1920 have resulted in a large increase in the number of cases of disease reported and of clinics in operation. The clinic reports show a tremendous increase in the number of persons treated and in the treatments given. The reports themselves are of greater value than in 1919, as the forms used are becoming standardized, and, with the clinic personnel becoming more accustomed to their use, the data submitted are more accurate. The survey of all cities with a population of 15,000 or over on the basis of measures in force for controlling venereal diseases has made possible a comprehensive study of 359 clinics. It is hoped through this study to determine what methods of operation are best adapted to the work of venereal-disease prevention and control and ultimately to raise the standard of clinic efficiency. Other phases of the medical work have been the special course for student nurses, the campaign with the dentists of the country, and the handling of requests for information received from persons infected with venereal diseases.

CLINICS.

Establishment of clinics.—At the close of 1919 there were 237 clinics operating under the joint control of the United States Public Health Service and the State boards of health. During 1920, 190 additional clinics have been established, an increase of over 80 per cent. Nineteen of these clinics have been discontinued, leaving 408 in operation on June 30. The following graph and table show the increase in number and the distribution of these clinics:

Clinics operating under joint control of the U.S. Public Health Service and State boards of health.

1919		237
1920		427

Distribution of clinics giving treatment for venereal diseases July 1, 1919-June 30, 1920.

State.	Clinics operating during the year 1919-20.	Clinics operating under joint control of U. S. Public Health Service and State boards of health, 1919-20.	Clinics discontinued during the year 1919-20.	Clinics remaining in operation June 30, 1920.	Clinics under joint control of U. S. Public Health Service and State boards of health remaining in operation June 30, 1920.	New clinics established during the year 1919-20.
United States.....	588	427	19	569	408	190
Alabama.....	12	12	2	10	10	5
Arkansas.....	4	4	1	3	3	1
California.....	21	16		21	16	1
Colorado.....	8	8	1	7	7	7
Connecticut.....	9	9		9	9	5
Delaware.....	2	2		2	2	2
District of Columbia.....	8			8		
Florida.....	12	11		12	11	4
Georgia.....	7	7		7	7	1
Illinois.....	26	16		26	16	11
Indiana.....	18	18		18	18	9
Iowa.....	12	12	1	11	11	6
Kansas.....	7	7	1	6	6	2
Kentucky.....	21	21	2	19	19	19
Louisiana.....	4	4		4	4	
Maine.....	5	5		5	5	
Maryland.....	13	5		13	5	3
Massachusetts.....	18	18		18	18	2
Michigan.....	12	10		12	10	7
Minnesota.....	5	4		5	4	
Mississippi.....	5	5		5	5	1
Missouri.....	10	8		10	8	5
Montana.....	3	3		3	3	1
Nebraska.....	9	9		9	9	6
New Hampshire.....	3	3		3	3	2
New Jersey.....	12	9		12	9	3
New Mexico.....	2	2		2	2	2
New York.....	79	42	1	78	41	11
North Carolina.....	11	11		11	11	5
North Dakota.....	3	3		3	3	1
Ohio.....	25	20	2	23	18	2
Oklahoma.....	14	13	5	9	8	1
Oregon.....	2	1		2	1	
Pennsylvania.....	104	31		104	31	31
Rhode Island.....	6	6		6	6	2
South Carolina.....	8	8		8	8	2
South Dakota.....	3	3		3	3	2
Tennessee.....	7	7		7	7	2
Texas.....	10	10		10	10	4
Utah.....	5	5		5	5	1
Vermont.....	2	2		2	2	1
Virginia.....	11	10		11	10	3
Washington.....	4	4		4	4	4
West Virginia.....	11	11	3	8	8	2
Wisconsin.....	11	11		11	11	10
Wyoming.....	1	1		1	1	1

It is interesting to note that Pennsylvania, which did not adopt regulations or make its appropriation until about the 1st of March, has 104 clinics in operation, 31 of which are under State and Federal control. This is due to the extensive venereal-disease control program already in operation when Federal aid was secured.

CLINIC REPORTS.

In 1919 the reports of 167, or 70 per cent, of the clinics in operation under State and Federal control, were tabulated as to the persons admitted and discharged. This year reports of 383, or 90 per cent,

of the clinics have been tabulated not only as to persons admitted and discharged, but also as to diseases treated, treatments given, arsphenamine administered, Wassermann tests, and microscopic examinations for gonococcus infection given.

The reported admissions to clinics in 1920 have been 126,131, an increase of 113 per cent over 1919. Of these 62,205 had syphilis, 57,561 gonorrhea, and 6,365 chancroid. It is interesting to notice that more cases of syphilis than of gonorrhea were treated in spite of the greater incidence of gonorrhea in the country at large.

A total of 1,576,542 treatments have been reported in 1920, an increase of 199 per cent over 1919. Doses of arsphenamine administered have been 290,747; 175,872 Wassermann tests were made, and 155,275 examinations for gonococcus infection given. The following are the reports of the clinics in detail:

Reports of clinics operating under the joint control of the Public Health Service and State boards of health, July 1, 1919--June 30, 1920.

State and city.	Patients admitted to clinics.				Patients discharged as non-infectious.	Treatments given.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations for gonococcus.
	Total.	Syphilis.	Gonorrhea.	Chancroid.					
United States.....	126,131	62,205	57,561	6,365	34,215	1,576,542	290,747	175,872	155,275
Alabama.....	10,431	5,975	4,073	383	2,902	81,328	15,473	8,231	3,591
Anniston.....	451	101	323	27	294	10,322	413	163	377
Bessemer.....	442	251	173	18	154	2,763	496	319	231
Birmingham.....	5,165	3,370	1,689	106	1,324	28,712	7,128	4,492	769
Florence.....	449	206	203	40	238	5,344	759	467	473
Huntsville.....	431	207	202	22	106	4,247	1,181	646	260
Mobile.....	1,210	559	648	23	78	14,456	1,292	489	1,006
Montgomery.....	670	280	313	77	295	4,758	902	355	48
Riderwood.....	65	41	23	1	10	240	79	7	16
Sylacauga.....	58	12	37	9	25	662	81	73	34
Talladega.....	423	145	256	22	178	4,283	598	301	195
Thomaston.....	87	29	39	19	12	57	21	35	.....
Tuscaloosa.....	980	794	167	19	188	5,484	2,523	884	182
Arkansas.....	1,949	913	910	126	390	23,742	3,065	4,680	2,250
Fort Smith.....	59	18	39	2	22	202	49	21	78
Hot Springs.....	1,404	636	665	103	312	19,439	2,138	4,075	1,435
Little Rock.....	486	259	206	21	56	4,101	878	584	737
California.....	5,010	2,843	2,084	83	870	78,319	12,975	14,016	8,741
Fresno.....	135	54	76	5	22	1,145	166	171	116
Los Angeles (3).....	1,985	998	954	33	195	26,848	3,762	2,807	1,633
Oakland.....	244	82	158	4	103	3,355	214	184	235
Pasadena.....	75	61	14	.....	13	1,036	283	289	82
Riverside.....	14	8	6	.....	3	147	14	20	18
Sacramento.....	143	76	59	8	104	3,229	112	175	227
San Bernardino.....	108	65	41	2	26	1,095	344	165	89
San Diego.....	154	104	50	.....	34	1,745	458	433	137
San Francisco (3).....	1,705	1,120	569	16	226	32,250	6,280	8,390	4,796
San Jose.....	164	129	33	2	5	3,983	814	734	165
Santa Barbara.....	68	52	16	.....	46	817	161	232	41
Stockton.....	215	94	108	13	93	2,669	358	416	1,202
Colorado.....	1,028	447	533	48	590	8,838	1,619	414	1,362
Buena Vista.....	63	54	8	1	20	632	325	172	6
Colorado Springs.....	44	31	13	.....	6	427	79	37	17
Denver (2).....	646	261	341	44	506	6,389	1,059	77	1,136
Fort Collins.....	9	3	6	.....	3	40	3	6	6
Pueblo.....	174	57	116	1	13	800	66	61	102
Trinidad.....	73	30	42	1	29	397	62	40	44
Salida.....	19	11	7	1	13	153	25	21	51

Report of clinics operating under the joint control of the Public Health Service and State boards of health, July 1, 1919-June 30, 1920—Continued.

State and city.	Patients admitted to clinics.				Patients discharged as non-infections.	Treatments given.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
	Total.	Syphilis.	Gonorrhea.	Chancroid.					
Connecticut.....	1,234	593	607	34	919	17,226	3,370	1,530	969
Bridgeport.....	357	198	145	14	152	5,891	1,036	237	138
Hartford.....	190	79	107	4	125	1,842	370	113	69
New Haven.....	386	187	197	2	496	8,017	1,708	951	298
New London.....	83	35	40	8	37	512	112	73	160
Stamford.....	173	75	92	6	130	714	139	144	214
Waterbury.....	45	19	26	.....	9	250	5	12	.....
Delaware.....	387	245	138	4	71	5,786	790	723	507
Dover.....	67	39	27	1	31	94	68	33	.....
Wilmington.....	320	206	111	3	40	5,692	722	690	507
Florida.....	2,818	1,870	821	127	673	25,205	8,969	3,449	1,501
Arcadia.....	155	105	24	26	54	1,655	651	267	222
Fort Pierce.....	25	18	6	1	5	46	39	23	2
Jacksonville.....	1,679	1,245	420	14	99	13,767	6,458	2,152	682
Key West.....	77	32	36	9	55	1,134	205	83	.....
Lake City.....	77	64	11	2	36	300	160	51	8
Miami.....	55	26	28	1	20	320	56	3	8
Pensacola.....	131	30	84	17	33	1,756	112	62	123
Sanford.....	15	7	5	3	2	52	10	.....	1
Tampa.....	495	278	175	42	343	5,767	1,093	620	362
West Palm Beach.....	109	65	32	12	26	408	185	188	93
Georgia.....	5,248	3,173	1,757	318	1,113	42,392	10,767	6,968	1,749
Atlanta.....	1,466	1,214	247	5	.....	3,513	1,225	1,644	132
Augusta.....	236	103	113	20	73	5,710	487	619	234
Brunswick.....	93	61	26	6	52	513	222	222	89
Columbus.....	231	113	99	19	84	902	391	259	75
Macon.....	1,395	766	523	106	468	13,808	4,301	2,066	342
Rome.....	242	182	59	1	73	984	806	167	21
Savannah.....	1,585	734	690	161	363	16,962	3,335	1,991	856
Illinois.....	5,507	2,515	2,795	197	1,225	66,151	13,347	8,224	5,448
Alton.....	35	22	13	.....	5	263	117	42	27
Carlinville.....	133	61	67	5	58	726	291	127	85
Chicago (7).....	4,121	1,766	2,235	120	611	50,248	9,368	6,326	3,546
Chicago Heights.....	24	8	13	3	12	145	35	9	59
Decatur.....	247	145	101	1	170	5,289	1,148	454	653
East St. Louis.....	450	219	183	48	192	6,017	819	797	829
Rockford.....	115	53	57	5	19	635	185	101	90
Rock Island.....	198	105	78	15	83	656	454	100	44
Springfield.....	180	135	45	.....	73	2,162	928	265	105
Waukegan.....	4	1	3	.....	2	10	2	3	10
Indiana.....	7,384	3,055	4,011	318	2,007	119,558	18,427	10,274	9,966
Anderson.....	377	116	254	7	104	4,868	693	394	844
Brazil.....	34	20	10	4	13	492	69	31	13
Columbus.....	76	44	29	3	7	1,082	265	69	68
East Chicago.....	224	64	155	5	101	3,061	383	203	257
Evansville.....	1,007	398	514	95	171	12,950	2,088	1,120	230
Fort Wayne.....	258	75	172	11	11	2,720	434	350	487
Hammond.....	187	52	120	15	67	2,188	211	93	281
Indianapolis (2).....	1,674	877	762	35	609	43,196	4,258	2,907	2,441
Kokomo.....	478	18	287	10	139	5,478	1,143	753	1,512
Madison.....	76	27	47	2	14	916	70	38	17
Marion.....	205	75	119	11	46	1,536	215	85	35
Michigan City.....	210	51	140	19	111	3,875	447	251	542
Muncie.....	378	123	250	5	72	5,208	929	348	505
Newcastle.....	132	30	95	7	64	1,448	83	117	219
Richmond.....	69	37	31	1	4	474	82	41	31
South Bend.....	626	184	427	15	181	8,530	1,068	556	1,623
Terre Haute.....	1,373	701	599	73	293	21,536	5,989	2,918	861

Reports of clinics operating under the joint control of the Public Health Service and State boards of health, July 1, 1919-June 30, 1920—Continued.

State and city.	Patients admitted to clinics.				Patients discharged as non infectious.	Treatments given.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
	Total.	Syphilis.	Gonorrhea.	Chancroid.					
Iowa.....	1,402	638	705	59	696	19,623	3,945	2,720	2,413
Clinton.....	206	97	88	21	98	838	222	83	24
Council Bluffs.....	41	12	28	1	25	728	96	34	82
Davenport.....	321	198	114	9	88	3,879	1,758	1,231	412
Des Moines.....	625	255	359	11	395	11,916	1,625	1,197	1,239
Fort Dodge.....	9	1	7	1	1	11	.....	2	4
Grinnell.....	11	2	9	.....	4	310	6	3	25
Io va City.....	116	45	66	5	64	1,388	153	111	543
Marshalltown.....	19	6	10	3	10	370	15	20	33
Mason City.....	54	22	24	8	11	183	70	39	51
Kansas.....	2,317	1,226	1,044	47	1,107	42,592	5,877	2,842	3,644
Eldorado.....	464	258	205	1	394	6,088	1,165	216	494
Kansas City.....	39	26	13	.....	25	142	57	36	19
Lansing.....	693	278	404	11	451	23,330	2,363	1,060	1,815
Lawrence.....	16	5	9	2	4	90	8	11	38
Rosedale.....	581	484	79	18	.....	2,735	1,629	1,183	83
Topeka.....	156	43	110	3	22	963	126	48	412
Wichita.....	368	132	224	12	211	9,244	529	288	783
Kentucky.....	2,814	1,390	1,338	86	310	35,578	5,206	3,271	3,461
Bowling Green.....	20	8	10	2	3	45	28	.....	.....
Covington.....	73	48	25	.....	1	398	112	46	26
Dayton.....	185	100	85	.....	43	2,022	270	141	147
Frankfort.....	165	94	54	17	41	984	215	49	45
Fulton.....	150	97	52	1	23	287	104	29	.....
Georgetown.....	6	3	1	2	.....	5	3	3	.....
Hickman.....	88	28	47	13	21	279	64	11	6
Hopkinsville.....	6	3	3	.....	.....	20	6	3	3
Irrington.....	25	19	6	.....	17	139	18	9	.....
Lexington.....	49	26	19	4	15	431	86	29	29
Louisville.....	1,908	874	994	40	124	30,530	4,130	2,864	3,173
Madisonville.....	7	3	4	.....	.....	86	7	5	7
Mayfield.....	21	10	11	.....	11	25	7	5	.....
Maysville.....	13	11	2	.....	.....	36	11	13	8
Owensboro.....	42	26	10	6	2	167	64	15	9
Paducah.....	18	13	5	.....	.....	84	46	27	.....
Winchester.....	38	27	10	1	9	40	35	22	8
Louisiana.....	4,512	2,121	1,932	459	779	30,446	7,073	2,324	1,064
Alexandria.....	574	168	375	31	133	10,389	537	307	671
New Orleans (2).....	2,746	1,173	1,220	353	487	15,459	4,086	1,249	375
Shreveport.....	1,192	780	337	75	159	4,598	2,450	768	18
Maine.....	346	277	68	1	26	2,550	975	439	384
Augusta.....	40	26	14	.....	17	568	177	55	27
Bangor.....	148	135	12	1	.....	373	361	90	30
Bath.....	32	30	2	.....	1	590	260	190	206
Calais.....	28	20	8	.....	4	110	42	26	13
Portland.....	98	66	32	.....	4	909	135	78	108
Maryland.....	2,178	723	1,326	129	413	25,994	3,300	2,214	3,351
Annapolis.....	51	36	13	2	7	322	80	53	14
Cambridge.....	46	25	17	4	13	350	84	39	82
Baltimore.....	1,645	525	1,017	103	213	17,582	2,449	1,805	2,632
Cumberland.....	277	80	179	18	155	6,714	492	220	495
Hagerstown.....	159	57	100	2	25	1,026	195	91	128
Massachusetts.....	6,786	3,887	2,876	23	963	91,837	28,194	13,273	15,058
Attleboro.....	40	26	14	.....	36	343	212	73	23
Boston (4).....	5,279	3,002	2,274	3	759	72,873	23,288	10,403	13,286
Brockton.....	70	51	19	.....	11	562	257	15	25
Fall River.....	78	47	28	3	9	3,982	235	105	452
Fitchburg.....	62	41	21	.....	10	360	178	79	53
Lawrence.....	139	78	61	.....	7	1,621	458	270	41
Lowell.....	200	88	110	2	16	1,925	430	336	418
Lynn.....	124	70	54	.....	16	1,783	483	311	205
New Bedford.....	317	197	105	15	29	2,123	619	378	106
Pittsfield.....	17	7	10	.....	12	247	69	33	53

Reports of clinics operating under the joint control of the Public Health Service and State boards of health, July 1, 1919-June 30, 1920—Continued.

State and city.	Patients admitted to clinics.				Patients discharged as non-infectious.	Treatments given.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
	Total.	Syphilis.	Gonorrhea.	Chancroid.					
Massachusetts—Contd.									
Balem.....	28	21	7	.....	1	275	124	102	42
Springfield.....	293	173	120	.....	45	1,988	702	162	115
Westboro.....	26	13	13	.....	2	618	119	263	83
Worcester.....	113	73	40	.....	10	3,137	1,020	743	156
Michigan.....	1,319	653	621	42	374	6,963	1,567	3,302	1,945
Battle Creek.....	242	106	135	1	104	789	123	127	176
Flint.....	560	290	252	18	79	1,119	289	1,432	331
Grand Rapids.....	41	29	8	4	32	435	209	22	19
Ja-kson.....	152	86	51	15	43	1,009	452	308	140
Kalamazoo.....	74	32	40	2	41	398	61	121	176
Lansing.....	106	61	43	2	46	1,039	248	1,060	43
Muskegon.....	38	11	27	.....	14	125	33	31	49
Saginaw.....	106	38	68	.....	15	2,049	152	201	1,011
Minnesota.....	1,352	616	730	6	390	27,048	5,577	2,499	1,090
Duluth.....	411	134	273	4	107	6,440	1,011	422	545
Minneapolis (2).....	575	304	271	.....	155	14,806	3,552	1,312	301
St. Paul.....	366	178	186	2	128	5,802	1,014	765	244
Mississippi.....	1,600	876	606	118	522	7,913	1,861	1,394	1,116
Hattiesburg.....	161	93	47	21	54	1,748	99	221	80
Ja-kson.....	800	506	274	20	189	3,869	1,188	896	378
Laurel.....	345	113	175	57	201	1,459	296	50	237
Meridian.....	126	106	16	4	16	251	242	37	16
Vicksburg.....	168	58	94	16	62	586	36	190	405
Missouri.....	4,728	1,788	2,522	418	465	39,918	2,597	574	4,137
Joplin.....	282	180	99	3	54	1,412	630	208	214
St. Joseph.....	178	80	96	2	15	1,379	197	122	165
St. Louis.....	4,268	1,528	2,327	413	396	37,127	1,770	244	3,758
Montana.....	335	265	70	.....	58	2,648	1,478	469	109
Billings.....	38	28	10	.....	3	172	94	48	35
Butte.....	294	237	57	.....	53	2,451	1,370	415	68
Great Falls.....	3	.....	3	.....	2	25	14	6	6
Nebraska.....	1,169	616	454	99	344	10,791	2,484	2,454	1,262
Beatrice.....	9	.....	9	.....	7	203	.....	.....	32
Tremont.....	34	12	20	2	25	266	23	20	36
Great Island.....	28	9	19	.....	11	195	25	25	54
Hastings.....	24	8	16	.....	10	681	59	12	97
Lincoln.....	221	122	86	13	78	1,785	599	886	364
North Platte.....	16	9	7	.....	1	31	17	28	25
Omaha (2).....	781	419	282	80	186	6,914	1,380	1,398	645
Winnebago.....	56	37	15	4	26	716	381	85	9
New Hampshire.....	347	179	165	3	83	6,451	1,360	698	309
Dover.....	24	15	9	.....	4	289	93	33	29
Manchester.....	271	133	136	2	69	5,577	1,138	616	249
Nashua.....	52	31	20	1	10	585	129	49	31
New Jersey.....	2,631	1,197	1,404	30	504	33,617	5,600	10,302	4,097
Camden.....	575	202	370	3	167	4,323	710	285	68
Elizabeth.....	57	28	29	.....	1	468	128	32	16
Jersey City.....	360	176	178	6	161	7,727	644	1,219	598
Long Branch.....	169	112	57	.....	13	2,181	365	239	52
Newark.....	815	331	470	14	32	8,370	455	7,448	2,877
New Brunswick.....	101	79	19	3	11	933	120	64	203
Orange.....	151	105	43	3	15	1,862	1,132	332	35
Plainfield.....	133	62	70	1	48	1,537	238	139	57
Trenton.....	270	103	168	.....	56	6,216	1,808	544	191
New Mexico.....	6	4	2	.....	.....	16	.....	4	1
Santa Fe.....	6	4	2	.....	.....	16	.....	4	1

Reports of clinics operating under the joint control of the Public Health Service and State boards of health. July 1, 1919—June 30, 1920—Continued.

State and city.	Patients admitted to clinics.				Patients discharged as non-infections.	Treatments given.	Doses of arsenphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
	Total.	Syphilis.	Gonorrhea.	Chan-roid.					
New York.....	6,973	3,124	3,505	344	2,092	100,634	23,893	7,618	4,144
Albany.....	60	43	15	2	31	1,294	588	111	21
Amsterdam.....	51	27	20	4	40	1,280	520	76	28
Batavia.....	10	8	2		2	57	36	21	13
Bath.....	6	6			2	22	16	43	
Binghamton.....	275	137	138		98	5,062	1,757	350	151
Buffalo.....	938	451	472	15	218	12,422	2,554	986	371
Corning.....	44	26	18		7	364	136	23	34
Dunkirk.....	33	15	16	2	17	365	81	30	141
Elmira.....	70	36	34		3	361	129	23	2
Gloversville.....	41	29	10	2	21	910	371	71	26
Glens Falls.....	88	50	38		3	414	136	57	31
Hornell.....	40	32	8		8	206	149	29	10
Ithaca.....	135	49	83	3	10	1,269	348	151	610
Jamestown.....	56	35	21		6	117	88	70	17
Johnstown.....	5		4	1	5	72		4	21
Kingston.....	5	3	2		2	30	14	14	5
Little Falls.....	35	32	2	1	3	126	91	18	4
Middletown.....	67	61	6		8	741	382	111	35
Niagara Falls.....	149	54	86	9	75	1,451	322	160	260
North Tonawanda.....	25	13	11	1	7	70	32	22	20
Oswego.....	51	34	17		36	475	272	47	21
Port Chester.....	29	15	14		1	103	38	20	16
Poughkeepsie.....	54	33	21		26	1,178	190	142	110
Rochester (4).....	507	382	125		87	13,060	5,658	1,651	430
Rome.....	121	55	65	1	41	1,030	270	122	83
Schenectady.....	147	54	91	2	61	1,814	259	169	101
Syracuse.....	612	221	357	34	43	6,072	668	477	191
Troy.....	105	68	36	1	68	1,515	524	154	63
Utica.....	209	95	109	5	31	3,905	641	313	200
Yonkers.....	126	66	46	14	12	3,320	531	277	99
New York City ¹	2,879	994	1,638	247	1,120	41,529	7,092	1,876	1,030
North Carolina.....	2,680	1,208	1,225	247	1,080	27,006	5,143	2,582	1,213
Asheville.....	251	90	123	38	148	2,613	372	185	76
Charlotte.....	694	445	213	36	19	9,847	2,357	1,224	251
Clinton.....	58	12	40	6	29	218	23	24	70
Fayetteville.....	247	173	62	12	135	1,281	628	138	131
Goldsboro.....	47	13	28	6	29	514	27	121	40
Greensboro.....	362	140	184	38	326	4,119	638	374	275
High Point.....	59	31	25	3	38	1,325	67	2	4
Raleigh.....	46	35	9	2	40	382	89	64	12
Rocky Mount.....	36	17	18	1	19	202	91	68	18
Wilmington.....	400	130	215	55	66	2,271	344	187	110
Winston-Salem.....	480	122	308	50	231	4,234	507	195	226
North Dakota.....	144	48	96		29	737	202	69	163
Fargo.....	14	9	5			32	21	6	8
Grand Forks.....	30	16	14		5	180	85	30	27
Minot.....	100	23	77		24	525	96	33	128
Ohio.....	9,747	4,705	4,587	455	2,591	125,800	19,742	15,020	11,750
Akron.....	2,114	799	1,205	110	445	31,945	3,808	3,512	6,085
Alliance.....	222	95	126	1	55	1,967	436	147	101
Ashtabula.....	10	1	9			82	1	5	10
Chillicothe.....	110	28	82		20	770	77	41	99
Cincinnati (2).....	1,227	724	432	71	509	13,054	1,751	2,034	559
Cleveland (4).....	2,562	1,492	985	85	791	36,687	6,613	5,029	1,894
Columbus.....	405	299	101	5	17	6,002	1,362	637	384
Dayton.....	359	163	182	14	31	4,388	823	434	383
Hamilton.....	95	39	55	1	20	706	182	72	57
Lima.....	294	171	122	1	53	5,275	1,125	807	131
Lorain.....	57	29	25	3	3	531	177	83	41
Portsmouth.....	446	148	234	64	172	4,798	969	414	75
Springfield.....	177	51	118	8	82	1,283	118	67	254
Toledo.....	1,268	487	699	82	310	14,162	1,495	1,334	1,415
Youngstown.....	244	117	122	5	52	2,459	483	327	210
Warren.....	157	62	90	5	31	1,691	322	77	52

¹ New York Skin and Cancer Hospital.

Reports of clinics operating under the joint control of the Public Health Service and State boards of health, July 1, 1919-June 30, 1920—Continued.

State and city.	Patients admitted to clinics.				Patients discharged as non-infectious.	Treatments given.	Doses of arsenphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
	Total	Syphilis.	Gonorrhea.	Chan-roid.					
Oklahoma.....	4,748	2,129	2,238	381	1,907	90,093	17,391	4,784	3,800
Ardmore.....	368	202	116	20	71	1,722	719	225	25
Bartlesville.....	199	82	117	.....	78	1,539	442	120	259
Chickasha.....	140	61	58	21	167	3,707	342	123	184
El Reno.....	116	44	67	5	96	451	232	38	22
Enid.....	83	21	17	12	54	127	21	3	10
Holdenville.....	66	22	39	5	65	909	66	33	10
Miami.....	62	19	40	3	19	657	71	19	63
Muskogee.....	312	213	75	24	120	1,446	603	134	70
Oklahoma City.....	1,757	676	884	197	521	42,432	4,524	1,714	1,696
Picher.....	662	293	305	64	522	2,816	1,075	101	222
Shawnee.....	83	29	50	4	27	912	98	33	29
Tulsa.....	900	464	410	26	167	30,045	9,192	2,211	1,130
Oregon.....	440	253	185	2	47	1,976	641	379	309
Portland.....	440	253	185	2	47	1,976	641	379	309
Pennsylvania.....	1,490	914	533	43	741	17,898	6,618	2,469	588
Allentown.....	88	61	25	2	35	1,469	790	270	26
Altoona.....	23	13	10	.....	12	531	62	16	20
Bethlehem.....	62	45	13	4	3	488	359	75	19
Bloisburg.....	10	10	.....	.....	.....	42	.....	89	.....
Butler.....	16	8	6	2	21	145	41	13	4
Carlisle.....	7	4	3	.....	4	71	32	6	1
Chester.....	28	10	15	3	22	463	16	28	33
Clearfield.....	10	4	2	4	8	135	52	27	1
Coatesville.....	8	3	5	.....	4	106	18	11	4
Easton.....	67	27	38	2	40	747	241	132	55
Erie.....	12	34	8	.....	10	593	186	53	6
Greensburg.....	33	28	5	.....	3	185	60	.....	.....
Hazleton.....	15	3	7	5	1	64	3	18	12
Harrisburg.....	82	47	32	3	45	1,193	227	38	56
Johnstown.....	43	19	24	.....	8	321	89	56	19
Lancaster.....	25	22	3	.....	1	356	122	50	5
Lebanon.....	23	14	9	.....	6	327	128	36	9
New Castle.....	16	14	1	1	.....	261	75	28	1
Philadelphia.....	105	53	48	4	35	1,144	586	318	74
Phillipsburg.....	13	13	.....	.....	9	92	76	28	.....
Pittsburgh.....	276	170	106	.....	2	2,660	826	338	68
Pottsville.....	20	13	7	.....	11	365	168	37	26
Reading.....	76	44	31	1	154	1,091	325	228	50
Seranton.....	78	39	38	1	124	1,017	340	82	35
Shamokin.....	12	8	4	.....	67	308	100	19	.....
Sunbury.....	29	21	8	.....	22	518	154	43	22
Washington.....	49	36	10	3	19	526	115	73	8
Wilkes-Barre.....	145	68	69	8	56	1,995	916	285	32
Williamsport.....	39	35	4	.....	9	525	418	39	.....
York.....	50	48	2	.....	7	160	93	33	2
Rhode Island.....	819	491	320	8	74	15,270	4,813	3,894	1,270
Newport.....	52	33	15	4	12	140	97	51	12
Pawtucket.....	111	70	40	1	5	1,593	391	132	65
Providence (3).....	622	370	250	2	57	13,314	4,304	3,699	1,193
Woonsocket.....	34	18	15	1	.....	223	21	12	.....
South Carolina.....	8,681	4,113	3,934	634	2,347	113,961	17,993	10,918	9,065
Anderson.....	673	269	357	47	164	5,659	987	762	301
Charleston.....	1,047	439	508	100	508	13,325	1,616	1,197	340
Columbia.....	1,244	586	601	57	146	18,651	2,563	2,244	1,429
Florence.....	1,523	799	538	186	444	11,982	2,513	1,280	786
Greenville.....	1,345	593	621	131	315	31,723	3,846	2,178	2,224
Newberry.....	697	368	284	45	274	5,517	1,297	1,119	423
Orangeburg.....	937	577	319	41	127	8,475	2,252	1,484	66
Spartanburg.....	1,215	482	706	27	369	18,629	2,919	654	3,496
South Dakota.....	127	42	84	1	37	1,213	176	198	744
Aberdeen.....	74	21	53	.....	11	413	72	48	378
Lead.....	15	5	9	1	10	143	37	19	62
Sioux Falls.....	38	16	22	.....	16	657	67	131	304

Reports of clinics operating under the joint control of the Public Health Service and State boards of health, July 1, 1919-June 30, 1920—Continued.

State and city.	Patients admitted to clinics.				Patients discharged as non-infectious.	Treatments given.	Doses of arsphenamine administered.	Wassermann tests made.	Microscopic examinations gonococcus.
	Total.	Syphilis.	Gonorrhea.	Chancroid.					
Tennessee.....	1,711	814	790	107	422	40,688	4,000	3,585	9,740
Chattanooga.....	744	338	382	24	334	25,664	2,306	966	8,271
Memphis (2).....	708	360	279	69	79	8,194	1,271	2,370	634
Nashville.....	259	116	129	14	9	6,830	423	249	835
Texas.....	6,419	2,770	3,059	590	1,759	107,509	9,607	7,563	18,850
Beaumont.....	58	34	20	4	13	429	96	57	47
Dallas.....	558	311	232	15	58	4,479	1,042	505	420
El Paso.....	376	164	189	23	242	34,163	862	70	1,592
Fort Worth.....	876	441	381	54	64	6,516	392	350	365
Galveston.....	611	234	305	72	101	3,517	542	341	584
Houston.....	2,942	1,160	1,426	356	806	49,104	4,948	4,191	10,490
Port Arthur.....	26	5	18	3	6	354	19	4	28
San Antonio.....	935	393	480	62	464	8,714	1,574	2,002	5,298
Waco.....	37	28	8	1	5	233	132	43	26
Utah.....	698	286	388	24	261	5,467	1,164	558	488
Ogden.....	241	61	164	16	97	1,103	116	85	160
Salt Lake City (2)...	457	225	224	8	164	4,364	1,048	473	328
Vermont.....	110	62	48	.....	27	1,555	293	215	441
Barre.....	12	10	2	.....	4	96	50	3	4
Burlington.....	98	52	46	.....	23	1,459	243	212	437
Virginia.....	4,430	2,076	2,011	343	2,268	53,044	8,858	4,231	5,913
Alexandria.....	162	50	105	7	99	1,689	187	148	233
Danville.....	256	45	169	42	73	3,659	144	116	591
Lynchburg.....	368	91	248	29	103	3,789	341	317	516
Newport News.....	623	207	330	86	555	6,332	863	554	1,944
Norfolk.....	807	390	339	78	615	10,188	1,299	860	1,112
Norton.....	470	234	206	30	99	4,430	707	207	58
Petersburg.....	311	138	161	12	76	3,276	560	336	477
Portsmouth.....	124	33	81	10	55	1,425	76	45	22
Richmond.....	990	755	198	37	457	15,203	4,231	1,530	924
Roanoke.....	319	133	174	12	136	3,073	450	118	36
Washington.....	871	318	546	7	332	12,148	2,114	3,238	6,290
Bremerton.....	32	8	22	2	8	359	91	31	99
Seattle.....	258	146	108	4	3	2,011	1,414	2,871	483
Spokane.....	394	78	316	.....	262	9,073	433	435	5,178
Tacoma.....	187	86	100	1	59	705	176	401	530
West Virginia.....	856	611	235	10	258	4,667	1,532	447	318
Charleston.....	134	100	31	3	46	579	358	70	47
Glendale.....	45	45	.....	.....	34	69	58	.....	.....
Huntington.....	103	67	36	.....	8	323	237	44	34
Parkersburg.....	38	37	.....	1	13	112	61	12	4
Richwood.....	41	21	18	2	13	329	77	15	15
Wheeling.....	495	341	150	4	144	3,255	741	306	218
Wisconsin.....	336	153	172	11	113	4,279	668	803	700
Beloit.....	17	7	7	3	3	147	27	24	57
Green Bay.....	69	15	54	.....	44	313	29	62	63
Janesville.....	30	12	18	.....	14	424	90	47	38
La Crosse.....	22	7	15	4	4	208	18	47	36
Madison.....	45	25	20	.....	2	165	89	111	70
Milwaukee.....	101	58	36	7	40	2,400	328	426	181
Oshkosh.....	24	16	7	1	2	149	51	39	15
Superior.....	28	13	15	.....	4	473	36	47	240
Wyoming.....	13	3	10	.....	6	67	3	13	24
Casper.....	13	3	10	.....	6	67	3	13	24

NOTE.—Number to the right of the name of the city indicates the number of clinics in city.

The average number of treatments per person for the year, based on the number of persons admitted to clinics and of treatments given, is 12.5. The following are those clinics which have admitted over 1,000 persons, given over 11,000 treatments, and have an average of at least 12.5 treatments per person:

Hot Springs, Ark.	Oklahoma City, Okla.
Evansville, Ind.	Charleston, S. C.
Terre Haute, Ind.	Columbia, S. C.
Louisville, Ky.	Greenville, S. C.
Boston, Mass. (4 clinics).	Spartanburg, S. C.
New York City, N. Y.	Houston, Tex.
Akron, Ohio.	

The standard treatment for syphilis opens with a course of six injections of arsphenamine—one a week—followed by a rest period and a Wassermann. It is interesting to note that for the 62,205 syphilitic patients admitted to the clinics an average of less than five injections of arsphenamine per person has been given. The policy of the majority of the clinics is, therefore, to render the patient non-infectious, not to work for a cure. The States whose total clinic reports indicate an average of six or more treatments with arsphenamine for each patient are:

Indiana.	New York.
Iowa.	Oklahoma.
Massachusetts.	Pennsylvania.
Minnesota.	Rhode Island.
New Hampshire.	Washington.

The following clinics, having admitted at least 100 patients with syphilis, average 12 or more doses of arsphenamine for each person and a Wassermann for every six injections.

Worcester, Mass.	Binghamton, N. Y.
Minneapolis, Minn.	Tulsa, Okla.
Trenton, N. J.	Providence, R. I. (3 clinics).

THE CLINIC SURVEY.

In grading the 467 cities with a population of 15,000 and over, fully discussed on page 342, 359 clinics were surveyed and the data secured submitted to the division for consideration in rating the cities. The information was secured from the health officer, the director of the clinic, the clinician, and the officer making the survey of the city. A study of the data submitted has been made for the purpose of determining what equipment, personnel, and methods of operation are in use and how they affect the usefulness of the clinic. From the results of this study it is hoped to stimulate an interest in developing a higher standard of clinic efficiency.

The points upon which the study was based and the relative standing of the clinics follow:

1. Location:

(To be centrally located a clinic should be easily accessible to patients, preferably in an office building or elsewhere in the center of the town.)

Clinics located in—	Num- ber.	Per cent. ¹
Office buildings.....	59	16
Municipal buildings.....	85	24
Hospitals.....	142	40
Miscellaneous buildings.....	73	20

¹ Per cent of total (359).

2. Equipment:

(Adequate equipment consists of the following: Entire apparatus and duplicate parts for the proper mixing, neutralization, and administration of arsphenamine; apparatus for securing blood specimens; apparatus for injection or other methods of administration of mercury and its derivatives; sufficient apparatus for the treatment of cases of acute and chronic urethritis in the male and of vulvovaginitis in the female; the necessary instruments for proper instrumentation, such as dilatations, urethral applications, and instillations.)

	Num- ber.	Per cent.
Clinics with adequate equipment.....	300	84
Clinics with inadequate equipment.....	59	16

3. Sterilization:

(Adequate sterilization requires equipment for boiling instruments.)

Clinics with equipment for sterilizing by—

Steam	204	57
Boiling	342	95
Chemicals	14	4

4. History of patients:

(Complete history includes name, address, age, sex, color, occupation, family history, past history, present illness, source of infection, if possible, marital condition, possibility of patient's acting as a carrier.)

Clinics taking complete histories.....	254	71
Clinics taking incomplete histories.....	105	29

5. Record of treatment:

(Complete record of treatment includes day and hour of treatment, type of treatment, record of reaction, if any, improvement or lack of improvement at time of treatment.)

Clinics making complete record of treatment.....	257	72
Clinics making incomplete record.....	102	28

6. Distilled water:

(Preferably a still in the clinic; if no still is present, the water must not have been distilled for more than 12 hours at the time of administration.)

Clinics with good distilled water.....	248	69
Clinics with poor distilled water.....	95	26
Clinics with no distilled water.....	16	5

7. Treatment:

(Treatment to be good for both gonorrhea and syphilis must conform with that outlined in the Manual of Treatment of the Venereal Diseases.)

Clinics giving good treatment for—

Gonorrhea and syphilis.....	318	89
Gonorrhea only.....	7	2
Syphilis only.....	19	6

Clinics giving fair treatment for—

Gonorrhea and syphilis.....	8	2
Gonorrhea only.....	9	2
Syphilis only.....	6	1

Clinics giving poor treatment for—

Gonorrhea and syphilis.....	4	1
Gonorrhea only.....	11	4
Syphilis only.....	3	1

8. Laboratory facilities:

(If laboratory facilities are accessible, reports on blood specimens should be rendered within 24 hours and reports

Clinics having—

on smears within 6 hours.)		
Laboratory accessible.....	114	32
Laboratory inaccessible.....	245	68
Facilities for smears accessible.....	202	56
Facilities for Wassermanns accessible.....	166	46
Dark-field illumination.....	226	63

9. Days in operation:

Operating days a week per clinic, based on data from 352,
or 98 per cent, of total 359 clinics ----- 4.6

10. Hours in operation:

Operating hours a day per clinic, based on data from 329,
or 92 per cent, of total 359 clinics -----

Schedule of hours—

	Num- ber.	Per- cent.
Morning only-----	41	11
Afternoon only-----	63	17
Evening only-----	35	10
Morning and afternoon-----	36	10
Morning and evening-----	32	9
Afternoon and evening-----	80	22
Morning, afternoon, and evening-----	55	15
No schedule reported-----	17	6

11. Attendance:

Average daily attendance per clinic, based on data from
309, or 86 per cent, of total 359 clinics ----- 24

Clinics with average daily attendance of—

Less than 10-----	135	37
11-25-----	88	25
26-50-----	50	14
51-100-----	26	7
101 and over-----	10	3
No average reported-----	50	14

12. Method of building up clinic attendance:

Clinics given publicity by—

Police-----	38	11
Advertising-----	187	52
Social worker-----	196	55
Nurse-----	22	6
Other means-----	185	52

13. Fees:

Clinics charging fees----- 199 55

14. Personnel:

Total personnel:

Clinicians----- 397

Nurses—

Male----- 90

Female----- 398

Social workers—

Male----- 27

Female----- 201

Clerks—

Male----- 31

Female----- 124

Clinics having more than one clinician----- 21 6

Clinicians for these 21 clinics----- 77

Clinics having—

Male nurse----- 80 22

Female nurse----- 289 81

Male and female nurses----- 61 17

More than one nurse, male or female----- 98 27

15. Salaries:

Monthly salaries per clinic, based on data from 280,
or 78 per cent of total 359 clinics----- \$218.91

16. Cost of operation:

Monthly cost of operation per clinic, based on data
from 202, or 56 per cent of total 359 clinics----- 376.71

17. Per capita cost:

Monthly per capita cost of operation per clinic, based
on data from 234, or 65 per cent of total 359 clinics----- 1.80

Clinics with per capita cost of—

\$0.50 or under----- 50 14

\$0.51-\$1----- 79 22

\$1.01-\$1.50----- 37 10

\$1.51-\$2----- 21 6

\$2.01 and over----- 47 13

No per capita cost reported----- 125 35

After considering the 359 clinics as a whole, they were studied individually on the basis of their equipment, personnel, and methods of operation for the purpose of determining the relative efficiency of each clinic. Five classifications have been made. Clinics in class A have the following qualifications:

1. Location central.
2. Equipment adequate.
3. Sterilization adequate.
4. History complete.
5. Record of treatment complete.
6. Distilled water good.
7. Treatment good.
8. Laboratory accessible.
9. Five operating days a week.
10. Four operating hours a day.
11. Night hours.
12. Average daily attendance, 25.
13. Properly advertised.
14. A follow-up system.
15. No fees charged.
16. One or more nurses.
17. Social worker.
18. Clerk or one of clinic personnel acting as clerk.
19. Per capita cost, \$1 or less.

Only four clinics met these requirements.

The same qualifications were applied to class B clinics with the following exceptions:

8. No laboratory requirement.
9. Three operating days.
10. Three operating hours.
19. Per capita cost, \$1.25 or less.

Seven clinics qualified under class B.

The qualifications of clinics in class C were:

1. Location central.
2. Equipment adequate.
3. Sterilization adequate.
4. History complete.
5. Record of treatment complete.
6. Treatment for one disease good, for other fair.
7. Three operating days a week.
8. Two operating hours a day.
9. Night hours.
10. Average daily attendance, 15.
11. No fees charged.
12. Nurse.
13. Per capita cost, \$1.50 or less.

There were 14 clinics which met these requirements.

The following changes were made in class C requirements for class D:

2. No equipment requirement.
4. No history requirement.
9. No night hours required.
10. Average daily attendance, 12.
11. Fee charges allowed.
13. Per capita cost, \$2 or less.

Fifty-three clinics met class D requirements.

All clinics which did not come under these four classifications were grouped in class E. The large majority of the clinics surveyed come into this class. In some cases this was due to the fact that the per capita cost could not be determined where the clinic was located in a hospital or where the overhead expense of the clinic was part of the

general cost of operation of the institution. As it was unfair to place such clinics in class E, they were studied again on the basis of their other qualifications with the result that one was placed in class A, 5 in class C, and 20 in class D. This makes a total of 104, or 29 per cent of all the clinics surveyed in classes A-D, and 255, or 71 per cent, in class E.

A review of the different points upon which the study was based shows that, for most of the points given, more than 50 per cent of the clinics could be classed as efficient. For instance, 100 per cent are centrally located, 84 per cent have adequate equipment, 72 per cent have complete record of treatment, and 89 per cent have good treatment for both gonorrhea and syphilis. When the individual clinics are considered on the basis of several points, however, only 29 per cent rank as venereal-disease clinics of high-grade efficiency. Failure to qualify under one point might affect the rating of the clinic, and if it was an essential point place it in class E. A high per capita cost or a low average daily attendance disqualified many clinics. Many of the clinics in hospitals failed to make a higher grade because of the fee charged, which, though nominal, does not accord with the larger ideal of public service. Many others are low ranking because of incomplete records of treatment or because they have no night hours of operation. The Public Health Service does not wish to set an absolute standard with which all clinics must comply. This would be inadvisable. It does wish, however, that health officers, venereal-disease-control officers, and clinicians would study their clinics, improve their equipment, enlarge their personnel, and perfect their methods of operation, and so raise the general standard of clinic efficiency throughout the country.

REPORTING OF VENEREAL DISEASES.

Laws or regulations requiring that venereal diseases be reported are now in force in 47 States. Nevada and the District of Columbia only do not require any form of report for these diseases. The reports of cases from the State boards of health show an increase of 36 per cent over 1919 reports. The following graph shows the relative increase during the last two years:

Cases of venereal diseases reported to State boards of health.

1919

Chancroid	7,843
Syphilis	100,466
Gonorrhea	131,193

1920

Chancroid	10,861
Syphilis	142,869
Gonorrhea	172,387

It is interesting to note that the relative increase for gonorrhea and syphilis is approximately the same. In 1919 the number of cases of syphilis reported was 76 per cent of the number of cases of gonorrhea; in 1920 it was 82 per cent, a relative increase in the number of cases of gonorrhea over that of syphilis of only 6 per cent.

The reports from the State boards of health include the cases of venereal diseases reported by the clinics, which were as follows: Gonorrhea, 57,561; syphilis, 62,205; chancroid, 6,365. It is interesting to note that the cases of syphilis reported by the clinics are 44 per cent of those reported by the State boards of health, and that the cases of gonorrhea reported by the clinics are only 33 per cent of the total reported by the States. In other words, 56 per cent of the total cases of syphilis reported by the States came through physicians in private practice and hospitals, while 67 per cent of the cases of gonorrhea reported came from these sources.

The following are the detailed reports from the States:

Cases of venereal diseases reported to State boards of health, July 1, 1919-June 30, 1920.

State.	Total.	Gonorrhea.	Syphilis.	Chancroid.
United States.....	326, 117	172, 387	142, 869	10, 861
Alabama.....	17, 963	8, 147	9, 162	654
Arizona.....	423	309	113	1
Arkansas.....	4, 769	2, 856	1, 633	280
California.....	9, 102	4, 877	4, 225	.....
Colorado.....	4, 703	2, 958	1, 607	138
Connecticut.....	3, 576	1, 213	2, 359	4
Delaware.....	938	634	262	42
District of Columbia ¹.....	.....	.....	.....	.....
Florida.....	5, 010	2, 041	2, 766	203
Georgia.....	11, 904	6, 079	5, 483	342
Idaho ²	358	222	131	5
Illinois.....	31, 876	17, 670	13, 222	984
Indiana.....	9, 889	5, 282	4, 364	243
Iowa.....	4, 167	2, 935	1, 113	119
Kansas.....	3, 539	2, 093	1, 388	58
Kentucky.....	4, 165	2, 228	1, 810	127
Louisiana.....	8, 946	5, 104	2, 901	941
Maine.....	2, 182	1, 431	711	40
Maryland.....	3, 714	1, 928	1, 475	311
Massachusetts.....	12, 313	8, 420	3, 889	4
Michigan.....	19, 632	10, 986	8, 355	291
Minnesota.....	9, 527	5, 366	3, 952	209
Mississippi.....	3, 351	2, 052	1, 115	184
Missouri.....	6, 053	3, 537	2, 157	359
Montana.....	2, 295	1, 665	625	5
Nebraska.....	5, 999	3, 829	1, 866	304
Nevada ¹.....	.....	.....	.....	.....
New Hampshire.....	1, 212	769	422	21
New Jersey.....	7, 187	3, 445	3, 477	265
New York.....	35, 851	8, 250	27, 563	38
New Mexico.....	465	292	156	17
North Carolina.....	8, 745	5, 740	2, 461	544
North Dakota.....	1, 264	944	301	19
Ohio.....	13, 748	6, 838	6, 353	557
Oklahoma ³	7, 665	4, 430	2, 869	366
Oregon.....	1, 334	966	359	9
Pennsylvania ⁴	1, 584	534	1, 002	48
Rhode Island ¹	1, 224	485	732	7
South Carolina.....	11, 826	5, 719	5, 508	599
South Dakota.....	1, 250	962	257	31
Tennessee.....	6, 833	3, 702	2, 655	536
Texas.....	15, 264	8, 790	5, 324	1, 150
Utah.....	1, 925	1, 343	556	26
Vermont.....	970	619	351	.....
Virginia.....	5, 621	2, 680	2, 570	371
Washington.....	4, 189	3, 186	945	58
West Virginia.....	6, 246	4, 607	1, 417	222
Wisconsin.....	4, 077	3, 334	641	102
Wyoming.....	1, 183	890	266	27

¹ Venereal diseases not reportable.

² No report for June.

³ No report for May and June.

⁴ Three months only.

A comparison of the reports of cases from the individual States for the last two years shows that only eight of the States which have reported cases for both years show a decrease in the number reported. The increase in some States has been very large. The following table shows the States grouped according to their percentage of increase or decrease:

Table showing States ranked according to the percentage of increase or decrease in the number of cases of venereal diseases reported for the year 1920.

STATES SHOWING INCREASE.

Rank.	State.	Per cent of increase.	Rank.	State.	Per cent of increase.
1	Wyoming.....	3,484.85	18	Iowa.....	89.15
2	Wisconsin.....	773.02	19	Illinois.....	88.45
3	South Dakota.....	392.12	20	Indiana.....	69.07
4	North Dakota.....	307.74	21	South Carolina.....	54.75
5	Virginia.....	273.99	22	New York.....	49.27
6	Delaware.....	258.02	23	Arkansas.....	43.81
7	Utah.....	226.27	24	Minnesota.....	40.79
8	Michigan.....	213.01	25	Vermont.....	39.57
9	Nebraska.....	202.82	26	Washington.....	39.12
10	Alabama.....	170.47	27	Mississippi.....	37.62
11	Louisiana.....	167.52	28	West Virginia.....	27.26
12	Montana.....	147.03	29	Arizona.....	18.15
13	North Carolina.....	142.85	30	Connecticut.....	15.09
14	Oklahoma.....	137.16	31	Kansas.....	14.45
15	New Hampshire.....	133.08	32	Maryland.....	14.21
16	California.....	118.69	33	Colorado.....	13.03
17	Maine.....	97.82	34	Georgia.....	8.98

STATES SHOWING DECREASE.

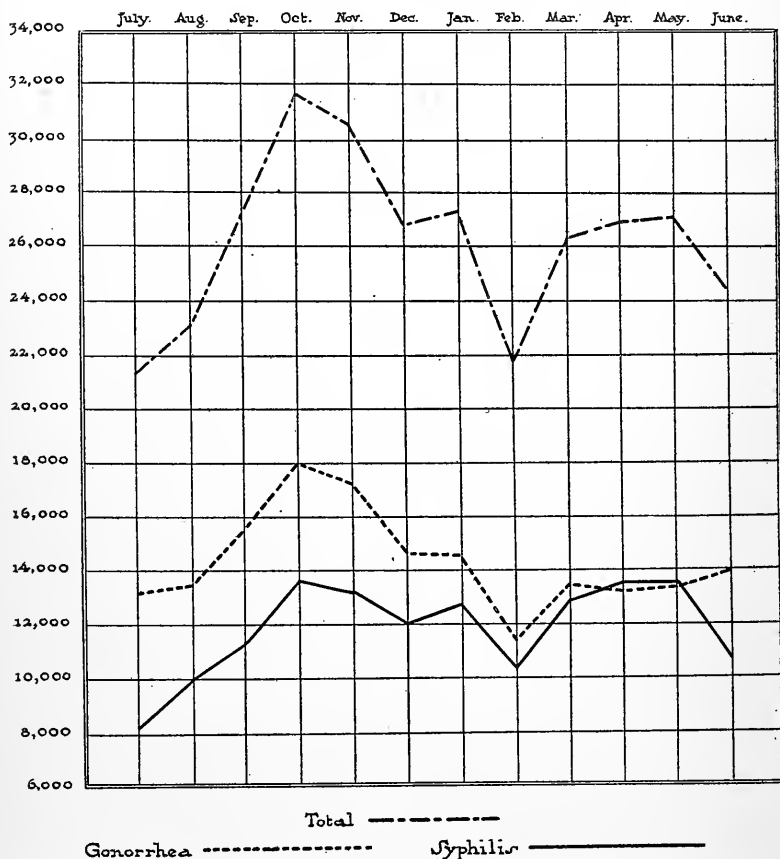
Rank.	State.	Per cent of decrease.	Rank.	State.	Per cent of decrease.
35	Kentucky.....	21.58	39	New Jersey.....	43.25
36	Oregon.....	23.51	40	Rhode Island.....	45.65
37	Ohio.....	28.74	41	Texas.....	51.44
38	Massachusetts.....	31.25	42	Florida.....	54.62

It is impossible to determine the incidence of venereal diseases from data available, what percentage of the total number of cases existing should be reported each year, or what proportion of this total is actually being reported. It will require careful study of reports submitted over a series of years, as well as a study of large groups of people from all classes of society, before conclusions approaching accuracy can be drawn. Work in this field is being done through a study of individual case reports from certain sections of the country, but no results can be reported now. The percentage of cases reported, based on the estimated population of the United States, is of interest, however. The cases reported in 1919 were 0.227 per cent of the estimated population of the United States on July 1, 1918; in 1920 they were 0.305 per cent of the estimated population on July 1, 1919.

The following graph shows the monthly variation in the number of cases reported by the States:

Cases of venereal diseases reported to State boards of health by months.

July 1, 1919 - June 30, 1920



Reporting reached its highest point in October, with a total of nearly 32,000 cases. The rapid increase from August through October may be accounted for in various ways. The educational campaign with physicians was being actively conducted by the States, with the result that cases were better reported. It is probable, also, that a large number of requests for examination and treatment were the result of such educational measures as the placards in railway cars and stations. The falling off in the number of reports received during the winter may have been due partly to the outbreak of influenza and partly to the lack of new intensive educational work. The drop again in June shows that active work with both physicians and the general public is needed to keep up the interest in this phase of the program.

DISTRIBUTION OF ARSPHENAMINE.

The State boards of health report 328,382 doses of arsphenamine distributed to physicians, hospitals, and clinics during 1920. Compared with last year's report of 118,055,²¹ this is an increase of 210,327, or 178 per cent. The State reports include 290,747 doses, which were also reported by the clinics. In other words, the clinics have administered 89 per cent of the total amount distributed by the States, leaving 37,635 doses, or 11 per cent, the amount given to hospitals and physicians in private practice.

The following graph shows the increase for 1920; the table gives the reports of the States in detail for 1919 and 1920:

Doses of arsphenamine administered through State boards of health.

1919  118,055

1920  328,382

State report of doses of arsphenamine (or similar product) administered.

State.	Year ending June 30, 1919.	Year ending June 30, 1920.	State.	Year ending June 30, 1919.	Year ending June 30, 1920.
United States.....	118,055	328,382	Montana.....	565	1,492
Alabama.....	3,308	16,334	Nebraska.....	485	2,845
Arizona.....	35	105	Nevada ¹		
Arkansas.....	934	4,894	New Hampshire.....	144	1,355
California.....	7,534	14,142	New Jersey.....	947	5,641
Colorado.....	155	1,622	New Mexico ¹		10
Connecticut.....	1,297	3,557	New York.....	9,047	29,895
Delaware.....	25	735	North Carolina.....	1,712	5,149
District of Columbia.....	270	1,149	North Dakota.....	24	171
Florida.....	2,178	10,578	Ohio.....	7,240	16,289
Georgia.....	5,840	12,910	Oklahoma.....	4,900	15,624
Idaho.....			Oregon.....	137	1,529
Illinois.....	3,142	18,518	Pennsylvania ¹		6,940
Indiana.....	1,049	18,812	Rhode Island.....	3,840	4,524
Iowa.....	1,213	4,221	South Carolina.....	9,000	17,583
Kansas.....	2,284	5,680	South Dakota ¹		165
Kentucky.....	5,804	6,009	Tennessee ¹		3,950
Louisiana.....	1,875	7,428	Texas.....	20,000	16,759
Maine.....	635	1,538	Utah.....	64	1,778
Maryland.....	816	3,252	Vermont.....	431	453
Massachusetts.....	12,578	25,646	Virginia.....	2,113	8,983
Michigan.....	1,440	5,277	Washington.....	745	4,846
Minnesota.....	2,930	6,636	West Virginia.....	421	5,690
Mississippi.....	816	1,654	Wisconsin.....	37	1,233
Missouri ¹		4,661	Wyoming.....	25	100

¹ No report received.

On June 21, 1920, the Secretary of the Treasury approved regulations for the control of the manufacture and sale of arsphenamine, neoarsphenamine, and sodium arsphenamine in accordance with the provision of section 4 of an act of Congress entitled "An act to regu-

²¹ The total, 353,054, reported in 1919 was an error.

late the sale of viruses, serums, toxins, and analogous products in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes." The regulations for arsphenamine follow; those for neoarsphenamine and sodium arsphenamine are similar:

1. Arsphenamine shall not be sold in interstate traffic, or in the District of Columbia, or exported or imported, except as provided herein.

2. Arsphenamine shall be offered for sale only in colorless glass ampules containing an atmosphere of an inert gas, or in a vacuum.

3. Each ampule shall be plainly marked so as to show the license number, the lot number, the name of the preparation, the actual amount of arsphenamine in the container, and the name and address of the manufacturer, in the following manner:

"License No. _____ Lot No. _____

"This package contains _____ grams of arsphenamine (hydrochloride of 3-diamino-4-dihydroxy-1-arsenobenzene) and conforms with regulations and tests prescribed by the United States Public Health Service. Made by _____"

The name arsphenamine shall be given precedence on the labels of containers and packages over the particular brand or trade name, and the size of type and display used for the name arsphenamine shall be at least as conspicuous as that used for the brand or trade name.

4. Each lot of the finished product shall be tested by the manufacturer for arsenic content and toxicity.

(1) The total arsenic content of the drug as obtained from the ampule shall not be below 30 per cent nor above 32 per cent, when determined according to Lehmann's method as described in Public Health Reports, volume 33, June 21, 1918, page 1012.

(2) The maximum tolerated dose shall not be less than 100 milligrams per kilo body weight for albino rats when tested as follows:

(a) Animals must be well nourished and free from disease, weighing from 100 to 150 gm. Pregnant animals shall not be used.

(b) *Feeding and care of animals.*—The rats should be fed both before and during the period of observation on a ration consisting of white bread, cracked corn, oats, cow's milk, and, in addition, twice weekly, fresh beef and cabbage. An adequate supply of fresh, clean water should be provided at all times. The rats should have no access to food for from 18 to 12 hours preceding the injection, though water should be supplied during this time.

(c) *Preparation of solution.*—The drug shall be dissolved in freshly glass-distilled water and made into the alkaline solution by the addition of 0.9 cc. N/1 sodium hydrate for each 0.1 gm. of the drug. The final concentration of the drug shall be in the proportion of 2 parts to 100. The drug shall be completely soluble in water in this proportion.

(d) *Method of injection.*—This should be made into the saphenous vein by means of a burette or a syringe, accurately graduated to 0.01 cc. When hemorrhage occurs, it should be controlled mechanically.

(e) *Rate of injection.*—This shall be at from 12 to 15 seconds for each 0.1 cc. of the solution.

(f) An anesthetic is not required.

(g) For each toxicity test a series of not less than five rats shall be used, and at least 60 per cent of the animals injected must survive at least 48 hours from the time of the injection, provided that if the first test is made on five rats only and more than one die the test must be repeated and the final result based on the total number of rats injected.

5. In addition to tests made by the manufacturer before the drug is put in ampules, final tests of the product as prepared for the market shall be made on each lot by the United States Public Health Service before its release. For this purpose samples of each lot shall be forwarded by the manufacturer to the Hygienic Laboratory of the United States Public Health Service. The number of samples supplied shall not be less than 10 ampules from any lot, and from lots of over 1,000 ampules 1 per cent shall be furnished. Each ampule forwarded shall contain at least 0.6 gm. arsphenamine. Accompanying each lot, the manufacturer shall send a copy of the report of the toxicity test and arsenic determination on which it was passed.

6. Officers of the United States Public Health Service, when duly detailed, may enter establishments for the purpose of securing samples and conducting inspections.

7. When lots have satisfactorily passed the prescribed tests, they may be offered for sale; but the right is reserved to require the withdrawal from the market of any lot designated by the Surgeon General of the United States Public Health Service.

8. Manufacturers shall retain 2 per cent of the product from each lot for a period of three months from the time the preparation is placed on the market, provided that in no case this is less than 10 ampules of at least 0.6 gm. each.

THE SEAMEN'S SERVICE CENTER.

In February the Seamen's Service Center was established in New York City under the direction of the Surgeon General of the Public Health Service with the cooperation of the American Red Cross and other social agencies. The purpose of the center is "to act as a clearing house through which the sick, disabled, and needy sailors of the merchant fleets of the world may be distributed to cooperating social agencies or individuals for detailed help, and, when necessary, sent to institutions, hospitals, or dispensaries for proper care and treatment."²²

The center is of special significance to this division because of the assistance given to sailors infected with venereal diseases. In the annual report for 1919 the following statement is made:

The exact percentage (of venereal diseases) is unknown, but the records of the marine hospitals which have been devoted to the care of American seamen show that over 22 per cent of all disabilities treated were due to venereal diseases.

When a sailor infected with gonorrhea or syphilis comes to the center he is referred to a clinic or hospital for treatment, and his case is handled according to the length of time he is in port. If his ship has no surgeon, he is given medicine and equipment for his treatment with explicit directions how to use both. He is also given the names and addresses of reputable physicians or of an authorized clinic or hospital at his first port of landing, and a record of the diagnosis, history, and previous treatment of his case.

During the six months approximately 2,500 persons have been given assistance. The center has proved its value as a helpful agency for men whose social opportunities are few and who need to be provided with means for improving their physical and social status while in port.

REQUESTS FOR INFORMATION AND TREATMENT.

The division has handled 3,161 requests for information in regard to treatment and addresses of clinics. Of these requests 2,657 came from persons complaining of a venereal disease, and it is probable that some of those suffering from "sexual weakness" or "lost manhood" in reality had gonorrhea. A classification of the requests according to the nature of the complaint follows:

Venereal diseases.....	977
Syphilis.....	577
Gonorrhea.....	962
Gleet.....	118
Chancroid.....	23
Masturbation.....	108

²² Passed Asst. Surg. E. W. Scott, Public Health Reports, vol. 35, No. 2.

Lost manhood.....	54
Seminal emissions.....	96
Sexual weakness.....	4
Addresses of clinics and literature.....	81
General.....	161
Total.....	3,161

Under the class "general" have been placed letters in which the writer complains of skin trouble or some nervous complaint which may possibly be due to a venereal disease. Inquiries concerning other conditions, such as varicocele, venereal warts, etc., have also been placed under this heading.

An interesting study was made of the reasons which led to an appeal to the Public Health Service given in 967 cases. First among the sources of information given were train and station placards, to which 310 persons referred. The following classification of sources of information has been made:

Train and lavatory placards.....	310
Health columns.....	123
Advertisements.....	145
Venereal-disease literature.....	63
Motion-picture films.....	71
War-risk insurance reports.....	248
Miscellaneous.....	7
Not stated.....	2,194
Total.....	3,161

The distribution of these requests by States is shown on the following table:

Requests for information received by the Public Health Service from persons infected with venereal diseases July 1, 1919-June 30, 1920.

United States.....	3,161	Montana.....	24
Alabama.....	56	Nebraska.....	37
Arizona.....	23	Nevada.....	4
Arkansas.....	51	New Hampshire.....	13
California.....	100	New Jersey.....	80
Colorado.....	38	New York.....	187
Connecticut.....	42	New Mexico.....	19
Delaware.....	6	North Carolina.....	68
District of Columbia.....	35	North Dakota.....	23
Florida.....	34	Ohio.....	252
Georgia.....	88	Oklahoma.....	63
Idaho.....	18	Oregon.....	30
Illinois.....	164	Pennsylvania.....	425
Indiana.....	75	Rhode Island.....	15
Iowa.....	59	South Carolina.....	40
Kansas.....	32	South Dakota.....	16
Kentucky.....	54	Tennessee.....	52
Louisiana.....	46	Texas.....	175
Maine.....	19	Utah.....	7
Maryland.....	45	Vermont.....	5
Massachusetts.....	66	Virginia.....	53
Michigan.....	96	Washington.....	51
Minnesota.....	49	West Virginia.....	58
Mississippi.....	49	Wisconsin.....	88
Missouri.....	89	Wyoming.....	25
		Foreign.....	17

DENTISTS, PHYSICIANS, AND NURSES.

DENTISTS.

Realizing that dentists are in a position to render valuable assistance in the work of venereal-disease control by reporting cases of syphilis of the mouth, and by referring patients to reputable physicians or clinics, the division sent a letter, bulletin, and agreement card to each of the 40,000 licensed and registered dentists of the country.

Each dentist was asked: (1) To report all cases of venereal disease coming under his observation in accordance with the laws and regulations of his State; (2) to advise treatment for all cases of venereal disease, referring them to a clinic or a competent physician.

At the close of the year 1920, or 38 per cent of the 40,000 dentists circularized have returned signed agreement cards. In referring these cards to the States, the division has urged boards of health to furnish the dentists, who showed a willingness to cooperate, with general information concerning the work, with addresses of available clinics, and with cards upon which reports of cases should be made. Furthermore, the States have been urged to increase the educational facilities available to dentists so that they may be able to diagnose more accurately syphilitic lesions found in the mouth.

The following table shows the distribution among the States of the dentists who returned agreement cards:

Agreement cards returned by dentists to the Public Health Service July 1, 1919–June 30, 1920.

United States.....	15,307	Montana	75
Alabama.....	142	Nebraska.....	350
Arizona.....	18	Nevada.....	11
Arkansas.....	150	New Hampshire.....	100
California.....	875	New Jersey.....	470
Colorado.....	200	New Mexico.....	30
Connecticut.....	280	New York.....	1,800
Delaware.....	19	North Carolina.....	100
District of Columbia.....	85	North Dakota.....	205
Florida.....	123	Ohio.....	900
Georgia.....	170	Oklahoma.....	180
Idaho.....	60	Oregon.....	174
Illinois.....	1,200	Pennsylvania.....	1,275
Indiana.....	325	Rhode Island.....	113
Iowa.....	400	South Carolina.....	67
Kansas.....	325	South Dakota.....	115
Kentucky.....	125	Tennessee.....	145
Louisiana.....	125	Texas.....	220
Maine.....	100	Utah.....	120
Maryland.....	125	Vermont.....	150
Massachusetts.....	1,100	Virginia.....	200
Michigan.....	550	Washington.....	315
Minnesota.....	475	West Virginia.....	100
Mississippi.....	100	Wisconsin.....	420
Missouri.....	560	Wyoming.....	40

PHYSICIANS.

In connection with the campaign with physicians in 1919, each State was urged to buy copies of the "Manual of Treatment of the Venereal Diseases" for distribution among physicians who returned

agreement cards. At the close of 1919, 14 States had purchased a total of 71,300 copies of the manual. During 1920 the following purchases have been made:

Colorado-----	720
Kentucky-----	1, 071
Nebraska-----	773
	<hr/>
	2, 564

Minnesota and New York have their own manuals, but have distributed copies of the service manual to the physicians who signed cards. These and the other States which could not purchase them were furnished manuals by the service as follows:

Maryland-----	732	Rhode Island-----	276
Minnesota-----	1, 018	South Dakota-----	289
Missouri-----	2, 307	Tennessee-----	1, 197
New Hampshire-----	237	Wyoming-----	93
Nevada-----	62		<hr/>
New York-----	5, 488		15, 750
Pennsylvania-----	4, 051		

NURSES.

The rapid extension of clinic service in connection with the control of venereal diseases and the recognized importance of skilled follow-up work from every clinic led to the preparation of a special course for graduate nurses in medical social service. This course was arranged by the Public Health Service in cooperation with Columbia University, Bellevue Hospital, and the New York School of Social Work. Provisions for 17 scholarships was made by the American Red Cross.

The aim of the course was to offer women—already graduate nurses—a view of the social problems implied in the control of venereal diseases. The course opened in July, 1919, as a part of the summer session of the department of nursing and health, Teachers' College, Columbia University. The subjects presented were "Problems of delinquency," "Prevention and control of venereal diseases," "Community problems," and "Medical aspects of venereal disease." After the close of the summer session at Columbia the students were given special field practice in connection with the clinics of Bellevue Hospital. The entire course covered about four months. It is of interest to note that each of the nurses enrolled secured a position in public-health work at the close of the course. The experiment was so successful that Columbia University has planned to repeat such a course.

Other work with nurses has included addresses before students in training schools, State nurses associations, and State public health nurses associations. An address was given before the National Organization for Public Health Nurses, and a special conference was held with the officials relative to introducing instruction in the work of venereal-disease control in courses given by this organization.

EDUCATIONAL MEASURES.

The largest increase in the general educational activities of 1920 is in the number of lectures, exhibit, and motion-picture film showings given. The routine work of handling requests for educational

pamphlets has been delegated largely to the State boards of health, and the division has been chiefly concerned with preparing new educational material, developing the work with industries and educators, directing the "Keeping fit" campaign, and other smaller undertakings. Considerable time and personnel of the educational section have been devoted to the survey of the cities and the grading of the schedules reported on page 342.

GENERAL FEATURES.

Pamphlets.—Requests for pamphlets received by the division and State boards of health have totaled 154,834. Of 51,319 received by the division, 32,519, or 63 per cent, were referred to the States for compliance, as compared with only 25 per cent so referred in 1919. It is interesting to note that the general requests number about the same for each year, 48,855 for 1919 and 41,617 for 1920. The requests from public officials and organizations, however, have dropped from 26,877 to 6,491, probably due to the fact that no large circularizations with such groups have been possible because of lack of material for distribution. The requests from industrial and commercial concerns, on the other hand, have doubled, probably because circularizing was made possible through an arrangement with the American Social Hygiene Association whereby material for distribution was secured without expense to the division.

Pamphlets distributed by the service and State boards of health during 1920 have totaled 8,082,792, as compared with 14,138,348 distributed in 1919. The States have distributed about 600,000 more pamphlets in 1920 than in 1919, but the distribution by the division amounted to 2,314,680 in 1920, as compared with 10,120,772 in 1919.

The States report 5,816,830 pamphlets purchased or reprinted in 1920, as compared with 10,510,524 reported in 1919. An analysis of the following table shows that 18 of the States have purchased more pamphlets in 1920 than in 1919, also that two-thirds of the entire decrease for the year is found in the reports of New York, Ohio, and Texas, whose reports averaged a decrease of 76 per cent:

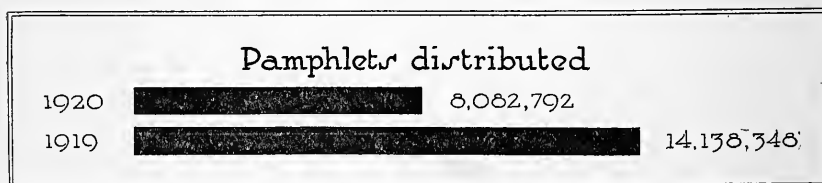
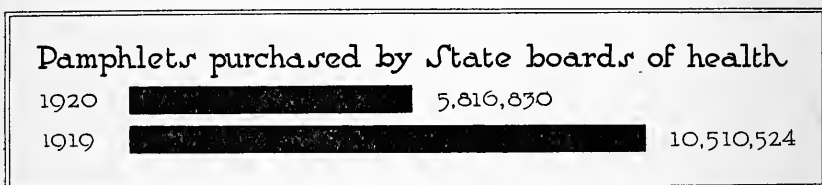
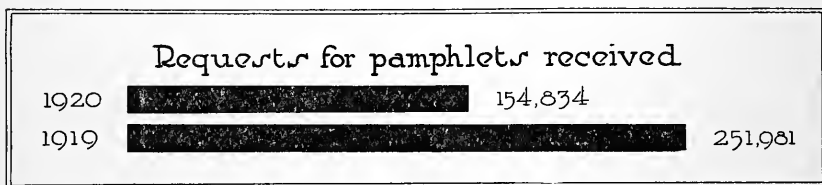
Educational pamphlets purchased and reprinted by State boards of health July 1, 1919–June 30, 1920.

State.	Total.	A	B	C	D	E	F	Others.
United States..	5,816,830	952,075	1,654,882	871,550	656,800	629,650	271,450	780,423
Alabama.....	106,500	5,000	15,000	25,000	12,500	10,000	4,000	35,000
Arizona.....	4,950		4,950					
Arkansas.....	95,000		65,000	25,000		5,000		
California.....	30,000	5,000		10,000	5,000		5,000	
Colorado.....	32,500	15,000	1,500	2,000	5,000	9,000		
Connecticut.....	63,900		53,900			10,000		
Delaware.....	10,500	10,000	500					
District of Columbia.....								
Florida.....	29,000	7,000	2,000	12,000	2,000		4,000	2,000
Georgia.....	47,800	10,000	300	30,000	5,500	2,000		
Idaho.....	37,700	6,000	14,000	5,000	6,000		6,700	
Illinois.....	270,500	60,000	118,000	32,500	15,000	45,000		
Indiana.....	244,000	30,000	132,000	20,000	10,000	30,000		22,000
Iowa.....	146,250	20,000			50,000		35,000	1,250
Kansas.....	3,250		1,500			40,000		1,750
Kentucky.....	86,200	20,000	25,000		10,000		20,000	11,200
Louisiana.....	17,185	5,000	11,630					555
Maine.....	326,000		2,000					324,000

*Educational pamphlets purchased and reprinted by State boards of health
July 1, 1919-June 30, 1920—Continued.*

State.	Total.	A	B	C	D	E	F	Others.
Maryland.....	46,275	40,275	1,000	.....	.....	5,000	.....	.....
Massachusetts.....	68,600	5,000	16,000	29,600	5,000	10,000	.....	3,000
Michigan.....	120,300	10,000	70,300	10,000	10,000	10,000	10,000	.....
Minnesota.....	305,000	70,000	60,000	70,000	60,000	40,000	5,000	.....
Mississippi.....	297,850	105,000	90,000	.....	50,000	.....	2,000	50,850
Missouri.....	181,400	75,000	11,500	35,000	20,900	9,900	10,000	20,000
Montana.....	159,800	10,000	149,800	.....	.....	.....	.....	.....
Nebraska.....	98,000	10,000	.....	30,000	20,000	20,000	10,000	8,000
Nevada.....	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire.....	22,500	4,000	2,000	4,000	4,000	4,000	4,000	500
New Jersey.....	430,150	85,500	124,500	80,600	18,500	111,200	7,950	2,800
New York.....	484,500	50,000	156,500	110,000	105,000	55,000	.....	8,000
New Mexico.....	2,950	.....	1,800	.....	100	1,050	.....	.....
North Carolina.....	442,022	158,500	42,822	42,500	98,700	36,000	38,000	25,500
North Dakota.....	35,000	.....	5,000	20,000	5,000	5,000	.....	.....
Ohio.....	229,000	5,000	50,500	45,000	15,000	26,000	.....	87,500
Oklahoma.....	13,000	6,000	2,000	.....	.....	.....	4,000	1,000
Oregon.....	60,850	.....	.....	8,850	.....	.....	.....	52,000
Pennsylvania.....	163,000	25,000	1,000	50,000	15,000	25,000	.....	47,000
Rhode Island.....	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina.....	60,000	11,900	36,000	10,000	.....	.....	.....	3,000
South Dakota.....	56,250	5,000	11,250	15,000	.....	10,000	.....	15,000
Tennessee.....	46,848	10,300	10,830	5,000	10,000	5,000	5,000	718
Texas.....	248,700	25,000	48,000	65,000	25,000	50,000	25,000	10,700
Utah.....	82,000	15,000	8,000	15,000	10,000	.....	5,000	29,000
Vermont.....	10,000	5,000	.....	.....	.....	5,000	.....	.....
Virginia.....	94,200	5,000	88,700	.....	.....	.....	500	.....
Washington.....	134,700	21,000	58,000	29,000	13,000	7,000	5,700	1,000
West Virginia.....	16,000	1,000	15,000	.....	.....	.....	.....	.....
Wisconsin.....	351,100	.....	146,100	35,000	51,500	38,000	65,500	15,000
Wyoming.....	5,600	1,500	1,000	500	.....	500	.....	2,100

The following graph shows the decrease for 1920 in requests for pamphlets received, pamphlets purchased by State boards of health, and pamphlets distributed:



The publication of educational material by the service has been greatly hampered by lack of funds for printing. During 1920 the following new venereal-disease bulletins have been issued:

51. Fighting Venereal Diseases.
52. An Appeal to Dentists for Cooperation in the Fight Against Venereal Diseases.
53. Is This Enough?
54. The Case Against the Red Light.

With the exception of No. 52, which was especially designed for use in circularizing the dentists, these pamphlets are all of general interest, and may be classed under Class B for the general public.

The bulletins which have been revised are:

6. Manpower.
- 12-20. The Industrial Bulletins.
32. Parents' Part.
55. Keeping Fit (revision of No. 1).

Bulletins which are in preparation are: Another pamphlet of general interest entitled, "Out-doing the Ostrich;" a pamphlet giving a report of the grading of 444 of the cities surveyed; and a new pamphlet for girls and young women. Work on the manual for educators has been continued throughout the year.

Exhibits.—New exhibit material made available has included a set of lantern slides based on the adult card exhibit. Much time has been spent on an exhibit for girls and young women, which will be published early in the fall. An edition of the boys' exhibit for use with colored boys is also in preparation. The "Keeping Fit" exhibit for boys has been revised, and now includes four cards on reproduction.

The States report 653 exhibits purchased, as compared with 125 in 1919. The following table gives the exhibit material purchased and borrowed by the States:

Exhibits, lantern-slide sets, and motion-picture films loaned to or purchased by State boards of health July 1, 1919-June 30, 1920.

State.	Ex-hibits.	Slides.	Films.	State.	Ex-hibits.	Slides.	Films.
United States.....	491	218	70	Montana.....	10	10	.....
Alabama.....	1	.....	1	Nebraska.....	5	15	1
Arizona.....	1	.....	.....	Nevada.....	.....	.....	.....
Arkansas.....	8	7	2	New Hampshire.....	.....	4	4
California.....	13	5	.....	New Jersey.....	17	1	6
Colorado.....	1	3	1	New York.....	50	33	7
Connecticut.....	.....	.....	1	New Mexico.....	3	1	.....
Delaware.....	.....	.....	1	North Carolina.....	.....	.....	.....
District of Columbia.....	.....	.....	.....	North Dakota.....	.....	.....	1
Florida.....	.....	.....	.....	Ohio.....	19	6	.....
Georgia.....	20	.....	6	Oklahoma.....	.....	.....	.....
Idaho.....	12	12	.....	Oregon.....	.....	.....	.....
Illinois.....	78	18	2	Pennsylvania.....	.....	10	.....
Indiana.....	.....	.....	.....	Rhode Island.....	.....	.....	.....
Iowa.....	5	15	2	South Carolina.....	8	4	1
Kansas.....	10	.....	.....	South Dakota.....	19	16	2
Kentucky.....	.....	.....	.....	Tennessee.....	7	.....	1
Louisiana.....	1	1	2	Texas.....	.....	13	1
Maine.....	.....	.....	2	Utah.....	1	.....	.....
Maryland.....	3	.....	3	Vermont.....	.....	.....	.....
Massachusetts.....	40	5	1	Virginia.....	.....	15	3
Michigan.....	12	4	2	Washington.....	1	.....	5
Minnesota.....	6	.....	4	West Virginia.....	1	2	.....
Mississippi.....	97	.....	2	Wisconsin.....	29	8	4
Missouri.....	8	10	1	Wyoming.....	6	.....	1

The reports of the States show that extensive use has been made of the exhibits both in connection with the "Keeping-Fit" campaign and in other activities. In Minnesota the need for an exhibit for girls was so keenly felt that one was prepared by Dr. Mabel S. Ulrich, of the State board of health, to be used in connection with the general educational work of the State. This exhibit is excellent and much of it has been incorporated in the exhibit now in preparation. Reports of the year's work show that 11,033 showings were made having an average attendance of 207.

Motion-picture films.—The States report purchases of 55 motion-picture films for 1920 and 1,916 showings. The Bureau of Education, Visual Instruction Section, through which the service's films have been circulated, has reported approximately 241 showings.

Lectures and addresses.—A total of 12,360 lectures and addresses with an average attendance of 134 has been reported, an increase of 56 per cent over 1919. At 521 of these meetings exhibit material was also shown.

The following table gives the State reports of pamphlets distributed, lectures, exhibit, and film showings given. To complete the report, "Keeping-Fit" showings tabulated on page 325 should be added where not included:

State report of educational activities, July 1, 1919–June 30, 1920.

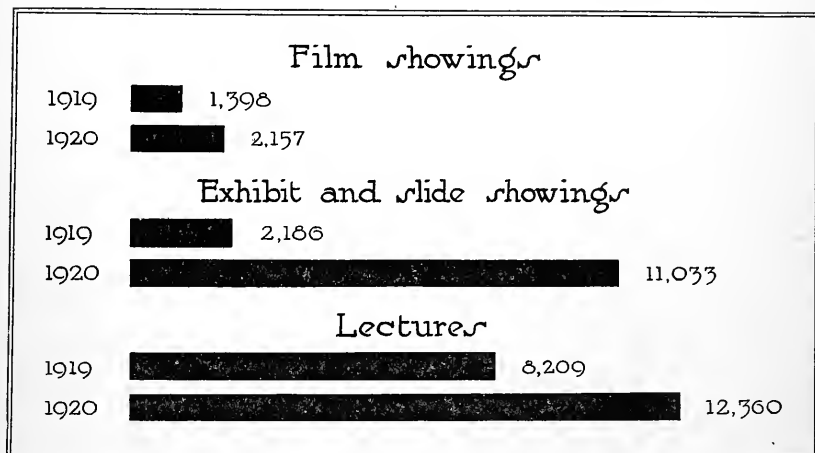
State.	Pamphlets distributed.	Lectures.		Film showings.		Exhibit and slide showings.	
		Number.	Average attendance.	Number.	Average attendance.	Number.	Average attendance.
United States.....	6, 488, 333	11, 797	131	1, 916	313	8, 209	236
Alabama.....	196, 966	314	142	3	150	102	.....
Arizona.....	216	13	124	.....	3	.....	.....
Arkansas.....	80, 725	318	190	75	326	113	102
California.....	78, 647	138	72	47	743	86	130
Colorado.....	45, 113	147	147	34	240	44	135
Connecticut.....	57, 897	55	584	4	300	2	.....
Delaware.....	22, 757	36	500	1	600	5	1, 000
District of Columbia.....	25, 748	6	37	.....	.....	58	103
Florida.....	46, 992	211	152	.....	.....	1 36	26
Georgia.....	65, 958	60	104	28	472	1 157	1, 146
Idaho.....	11, 049	39	41	.....	.....	68	.....
Illinois.....	568, 541	509	157	41	118	341	294
Indiana.....	235, 616	186	248	41	288	1 428	267
Iowa.....	105, 278	512	159	80	308	1 160	216
Kansas.....	98, 362	47	302	.....	.....	1 21	91
Kentucky.....	15, 463	97	410	25	221	1 272	.....
Louisiana.....	51, 128	205	187	5	160	25	1, 062
Maine.....	283, 316	23	119	21	305	670	.....
Maryland.....	48, 517	14	80	.....	.....	77	17
Massachusetts.....	69, 086	95	84	4	171	1 36	67
Michigan.....	109, 110	475	94	155	327	1 256	1, 477
Minnesota.....	198, 915	109	271	153	355	295	138
Mississippi.....	203, 016	3, 059	71	39	311	423	60
Missouri.....	135, 739	88	170	20	665	1 92	146
Montana.....	27, 129	71	46	55	.....	1 31	.....
Nebraska.....	230, 091	37	578	76	506	386	119
Nevada.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire.....	11, 417	49	208	19	195	9	175
New Jersey.....	353, 873	376	193	10	101	479	63
New York.....	1, 030, 434	855	137	34	1, 252	1 224	524
New Mexico.....	1, 905	.....	.....	.....	.....	17	15
North Carolina.....	268, 156	682	137	72	174	1 46	378
North Dakota.....	16, 674	159	60	7	125	8	117
Ohio.....	419, 806	634	107	49	479	1 78	76
Oklahoma.....	52, 565	40	501	28	604	1 40	612
Oregon.....	47, 402	534	53	193	304	1 29	77
Pennsylvania.....	46, 427	37	79	3	75	594	54
Rhode Island.....	7, 932	20	675	5	.....	15	.....

State report of educational activities, July 1, 1919—June 30, 1920—Continued.

State.	Pamphlets distributed.	Lectures.		Film showings.		Exhibit and slide showings.	
		Number.	Average attendance.	Number.	Average attendance.	Number.	Average attendance.
South Carolina.....	51,745	181	76	1	150	338	91
South Dakota.....	44,519	106	99	16	272	38	62
Tennessee.....	23,350	44	142	15	95	53	374
Texas.....	419,682	242	139	16	139	1,209	121
Utah.....	42,673	20	172	38	283	67	212
Vermont.....	560	14	423	1	2,000	(1)	.....
Virginia.....	234,496	214	184	20	415	.....	.....
Washington.....	44,409	105	179	81	188	159	375
West Virginia.....	92,402	218	150	91	264	396	179
Wisconsin.....	212,529	378	127	307	122	1,202	98
Wyoming.....	4,002	25	260	3	400	21	220

¹ Reports of "Keeping-Fit" campaign not included.

The following graph shows the increase in this phase of the work:



Conferences.—Twenty-five conferences, mostly with educators, with an average attendance of 188, were held under the auspices of the Public Health Service, making a total of 25,575 meetings reported for 1920, an increase of 117 per cent over 1919.

Publicity work.—Articles have been furnished by the division to 302 different magazines, including labor journals, fraternity periodicals, and industrial-house organs. Copies of 118 such periodicals, which have published the material sent, have been received. It is estimated that the articles published have reached 3,190,786 persons. Publicity has also been given to the venereal-disease bulletins through the press service of the section of public-health education.

SPECIAL FEATURES.

Industrial and commercial organizations.—In securing the cooperation of industrial and commercial groups "sales methods" have been used, by which employers are shown that there is a definite relation between venereal diseases and lost time, efficiency, delayed recovery from minor accidents, prolonged compensation, unsafe practices, costly accidents involving loss of life, labor turnover,

and falling off of production. To increase the efficiency of their employed force by facing this problem frankly employers are urged to include in their medical service free examination, diagnosis, and treatment of gonorrhea and syphilis, and to introduce educational preventive measures, such as lectures, exhibit and film showings, pamphlets and placards.

The standardized industrial program, comprising venereal-disease bulletins 12-20, has been revised, and now includes the following pieces:

Outline of plan.

Healthy Womanhood (placard for women).

The Government has Declared War on Venereal Diseases (placard for men).

For Girls (pamphlet for girls).

Facts about Venereal Diseases (pamphlet for men).

Order blank.

Industrial questionnaire.

General notice to employees.

Return envelope.

For issuing this material the American Social Hygiene Association underwrote a printing cost of \$6,988.63. Prior to July 1, 1920, \$5,514.57 has been returned by firms installing the program. Material still available may be valued at \$1,244.53, which means that industrial activity, as far as the distribution of educational material is concerned, has been practically self-supporting.

The value of making this activity self-supporting and non-profitting is twofold: (1) It enables the division to do work for which no printing funds are available. (2) It insures conscientious use of all educational material distributed. An employer who pays for material obviously will see that it is carefully used. Furthermore, it places the industrial work on a business basis, and for this reason has secured whatever cooperation has actually been given by many employers.

During the year 50,396 copies of the Industrial Program with letters have been sent out, 45,084 to industrial establishments, 3,565 to physicians, 1,236 to railroad officials and Y. M. C. A.'s, and 511 to others. As a result of this circularization 186,588 pieces of the program have been sold, 6,806 of which were framed placards. The following table summarizes the purchases made. Those made by the State boards of health are doubtless included in the general table of pamphlets purchased and reprinted on page 325 of this report:

Report of pieces of the industrial program purchased July 1, 1919-June 30, 1920.

	Total orders placed.	Total pieces purchased.	Pamphlets purchased.		Unframed placards purchased.		Framed placards purchased.	
			Men.	Women.	Men.	Women.	Men.	Women.
Total.....	579	186,558	96,478	31,307	30,595	21,402	3,194	3,612
By State boards of health....	15	27,330	.....	1,950	8,830	13,900	400	2,250
By firms in States completely circularized.....	468	108,345	69,586	22,491	7,433	5,727	2,228	880
By firms in States incompletely circularized.....	74	18,295	10,842	3,221	2,347	1,223	426	236
By railroads.....	22	22,618	16,050	3,645	1,985	552	140	246
By Marine Hospital.....	.....	10,000	.....	.....	10,000	.....	.....	.....

¹ 5,000 hand cards.

Many firms applied directly to their State boards of health for material. Many others have reprinted portions of the program for plant use. Two firms alone reprinted 65,000 copies of service pamphlets.

A total of 1,697 industries, including 60 railroads, returned executed questionnaires. These firms represent an employed force of 609,335, of which 44,020 are foreign born. About 40 per cent of these firms offer some form of medical service to their employees. As to their attitude toward introducing the industrial program for venereal-disease control, 79 per cent were willing to cooperate with their State boards of health, 75 per cent agree to post placards in rest rooms and toilets, 42 per cent were willing to buy educational material, and 28 per cent were willing to consider establishing a clinic either in their own plant or in conjunction with other plants.

A special effort has been made to secure the cooperation of railroad officials and employees. Conferences were held in January and February in Atlantic City and St. Louis with the chief surgeons, safety section officials, and operating executives of all railroads under Federal control. Officials of railroads under private operation were approached through the mail. Another conference was held in May with members of the Railroad Chief Surgeons' Association. The railway employees' section of the American Federation of Labor also was addressed by a service representative.

The result of this effort has been that lecture tours, arranged to reach employees all along the line, have been undertaken by several large railroads in connection with a general educational campaign. Other roads are adjusting their medical service to include diagnosis and treatment for venereal diseases and are undertaking to establish a relation of confidence between the medical department and employees who may be infected with gonorrhea or syphilis. Because of the danger of accident and consequent loss of life resulting from mental lapses of men in the early stages of paresis, efforts are being made to develop a plan whereby syphilitics may be detected and eliminated from responsible positions in railroad work. Sixty of the railroads approached returned questionnaires and 22 have purchased educational material in addition to those who secured material directly from State boards of health.

Other aspects of the industrial work have been the circularization of agents and clients of three large insurance companies, to whom copies of venereal-disease bulletin 24, War on Venereal Disease to Continue, were sent; the publication in 20 house organs and trade journals of specially prepared articles, reaching approximately 1,000,000 readers; and the distribution of 1,002 digests of Dr. John H. Stokes's article on syphilis among railroad employees. At the suggestion of the service, the National Safety Council has issued a second bulletin to its 3,000,000 readers. Plans are also under way to reach the 40,000 loggers and lumbermen of Washington, Oregon, Montana, and Idaho through the Loyal Legion of Loggers and Lumbermen.

Educators.—The Public Health Service believes that one of the best preventives of venereal diseases is adequate education in the physiology and hygiene of sex. Theoretically such instruction should be given children by their parents; as a matter of fact, however, this

is a phase of child training almost universally neglected. An effort has been made, therefore, to stimulate the introduction of this work into the schools. Because opportunities for such instruction are more numerous in high schools and because teachers there are more frequently qualified, special attention has been directed to the field of secondary education. It is believed that the most effective work can be done there in connection with existing courses, such as biology, physiology, physical education, and home economics.

In order to encourage instruction on sex subjects in high schools in this way and to discourage all unwise attempts by principals or teachers, conferences of educators are being held under the joint auspices of the Bureau of Education and the Public Health Service. In 1919, 12 conferences, with an attendance of about 2,400 leading educators, were held in States east of the Mississippi, and in 1920, 19 others have been held, having an attendance of about 2,800, covering States as far west as Colorado and Utah. Following is the list of 1920 conferences:

Date.	Place.	Scope.	Attendance.
1919.			
July 1.....	Milwaukee, Wis.....	(With the National Education Association.)	50
Oct. 24-25.....	Rochester, N. Y.....	Western New York.....	275
Dec. 5-6.....	Cleveland, Ohio.....	Northern Ohio.....	120
Dec. 10.....	Delaware, Ohio.....	Central Ohio.....	150
Dec. 12-13.....	Louisville, Ky.....	State.....	90
1920.			
Jan. 9-10.....	Des Moines, Iowa.....	State.....	220
Feb. 25.....	Cleveland, Ohio.....	(With the National Education Association.)	184
Feb. 28.....	Wheeling, W. Va.....	State.....	56
Mar. 12-13.....	Kansas City, Mo.....	Western Missouri.....	100
Mar. 19-20.....	Topeka, Kans.....	State.....	200
Mar. 25.....	Washington, D. C.....	Miner Normal School.....	150
Mar. 31.....	Minneapolis, Minn.....	State.....	110
Apr. 2-3.....	Chicago, Ill.....	do.....	300
Apr. 9-10.....	St. Louis, Mo.....	Eastern Missouri.....	64
Apr. 13.....	Little Rock, Ark.....	State.....	70
Apr. 16-17.....	Milwaukee, Wis.....	do.....	220
Apr. 30-May 1.....	Omaha, Nebr.....	Eastern Nebraska.....	150
May 7-8.....	Salt Lake City, Utah.....	State.....	140
May 14-15.....	Denver, Colo.....	do.....	70

Besides the general conferences, 48 lectures were given by a service representative to teachers in summer and normal school classes. (Both conferences and lectures have been included in the general summary of educational activities already given.) In the summer of 1920 a special course in social-hygiene education is being offered at Columbia University, Teachers' College, which will give teachers some of the background needed for this work.

Much time and careful thought have been devoted to the preparation of the manual for teachers, which will embody a definite program for giving sex education in the high schools. It is to contain 15 chapters and will comprise about 75 printed pages. The subject matter is divided into three parts. The first or introductory portion contains a general discussion of the social-hygiene movement and the problems and principles of sex education. It also includes a discussion of the place of sex education in secondary schools, and closes with

a review of the present status of sex education in the high schools. Part II discusses ways in which sex instruction may be included in definite high-school courses: Biology, general science, physiology, physical education, and home economics. It shows the opportunities for instruction in connection with the social studies and English literature. Part III discusses the opportunities for sex instruction outside the regular school courses, the need for the special training of teachers, and the responsibilities of normal schools and colleges in this field. It also explains how the high school should be organized for giving this instruction. The manual will be published in the fall.

An important feature of the work with educators has been securing the data upon which Chapter V, on the present status of sex education in the high schools, is based. Letters of inquiry were sent to approximately 12,500 secondary-school principals throughout the country. Executed questionnaires from 6,477 principals were returned.

Although sex instruction in secondary schools has only recently been advocated, the questionnaires show that 934 high schools are already giving it in some form in regular high-school courses. What is called "emergency sex instruction," which means holding lectures, personal interviews, exhibit showings, and distributing pamphlets, is being offered in 1,727 other high schools. About 59 per cent, or 3,816 secondary schools, report no sex instruction whatever. The following table classifies the questionnaires according to the kind of instruction given and shows their distribution by States:

Questionnaires returned by high schools to the Public Health Service July 1, 1919-June 30, 1920.

State.	Total questionnaires returned.	Schools giving sex instruction in regular courses.	Schools giving emergency sex instruction.	Schools giving no sex instruction.
United States.....	6,477	934	1,727	3,816
Alabama.....	54	4	13	37
Arizona.....	20	5	7	8
Arkansas.....	59	12	22	25
California.....	177	84	40	53
Colorado.....	49	8	28	13
Connecticut.....	33	3	11	19
Delaware.....	15	3	.....	12
District of Columbia.....	6	1	1	4
Florida.....	28	1	7	20
Georgia.....	55	9	15	31
Idaho.....	34	7	14	13
Illinois.....	365	59	101	205
Indiana.....	364	46	66	252
Iowa.....	388	33	143	212
Kansas.....	212	29	66	117
Kentucky.....	62	7	23	32
Louisiana.....	83	5	17	61
Maine.....	113	6	22	85
Maryland.....	50	3	7	40
Massachusetts.....	188	18	23	147
Michigan.....	292	35	94	163
Minnesota.....	143	21	39	83
Mississippi.....	55	4	24	27
Missouri.....	215	20	96	99
Montana.....	76	14	13	49
Nebraska.....	137	12	29	96
Nevada.....	13	1	4	8
New Hampshire.....	42	4	3	35
New Jersey.....	95	15	24	56
New Mexico.....	20	4	1	15
New York.....	466	71	73	322

Questionnaires returned by high schools to the Public Health Service July 1, 1919-June 30, 1920—Continued.

State.	Total questionnaires returned.	Schools giving sex instruction in regular courses.	Schools giving emergency sex instruction.	Schools giving no sex instruction.
North Carolina.....	170	15	37	118
North Dakota.....	82	9	31	42
Ohio.....	471	92	156	223
Oklahoma.....	50	11	11	28
Oregon.....	119	15	50	54
Pennsylvania.....	581	83	107	391
Rhode Island.....	16	2	3	11
South Carolina.....	41	4	9	28
South Dakota.....	47	4	19	24
Tennessee.....	71	9	14	48
Texas.....	173	28	38	107
Utah.....	21	12	9	.....
Vermont.....	35	4	9	22
Virginia.....	65	3	20	42
Washington.....	120	21	30	69
West Virginia.....	87	22	32	33
Wisconsin.....	251	32	94	125
Wyoming.....	23	2	7	14
Location not stated.....	145	22	25	98

A study of the questionnaires from the 934 high schools, including sex instruction in regular courses, shows that 59 per cent are giving it in biology courses, 5 per cent in physical education, 6 per cent in general science, 5 per cent in household science, 48 per cent in physiology and hygiene, and 18 per cent in other courses. It is of particular interest to note that so little use is being made of household science and physical education courses. The natural segregation of classes in these courses offers an unusual opportunity for the treatment of sex subjects without attracting the special attention to them which is always undesirable. It is also surprising to note that so little use is being made of the general science course, especially as it is widely taught and is often compulsory.

As to the character of the instruction given, 79 per cent of the high schools are teaching human reproduction, mostly in connection with biology; 35 per cent are giving instruction about venereal diseases, 17 per cent about menstruation, and 10 per cent about seminal emissions, all largely in connection with physiology or hygiene. The courses used most frequently, therefore, for presenting the subjects of venereal diseases and personal sex hygiene are physiology and hygiene. Following are the tabulated results of this study:

Courses.	Total.	Human reproduction.	Venereal diseases.	Menstruation.	Seminal emissions.
Total.....	.....	740	324	161	94
Biology.....	555	445	83	15	12
General science.....	57	41	9	2	5
Physiology or hygiene.....	451	146	135	104	66
Physical education.....	49	6	20	15	8
Household science.....	41	19	4	18	.....
Other subjects.....	166	83	73	7	3

A study of the questionnaires has also been made to determine the attitude of high-school principals on the advisability of introducing into the standard courses of the curriculum instruction in human reproduction, venereal diseases, internal secretion of the sex glands, menstruation, and seminal emissions. The results show that 85 per cent of those expressing an opinion favor such action, 10 per cent doubt its advisability, and 5 per cent only definitely oppose it. Those who are doubtful fear over-emphasis of the subject, improper methods, or unwise teachers. Most of those who are opposed think the home the proper place for such instruction, not taking into consideration that the home has failed to meet this educational need for most children. The tabulated results of this study follow:

Attitude expressed.	Total.	Schools giving sex instructions with some organized course.	Schools giving emergency sex instruction.	Schools giving no sex instruction.
Total.....	6,477	934	1,727	3,816
Favorable.....	4,167	832	1,073	2,262
Doubtful.....	466	67	153	246
Opposed.....	243	-----	100	143
Attitude not expressed.....	1,601	35	401	1,165

The "Keeping-Fit" campaign.—A conference was called in Washington November 4-5 to discuss the national "Keeping-Fit" campaign for boys 15 to 20 years of age. Representatives of the health departments of 31 States and the District of Columbia were present, as were also those of 11 independent educational organizations. Methods were discussed for reaching adolescent boys with the "Keeping-Fit" exhibit and suitable pamphlets.

As a result of the conference supervisors were appointed in practically every State to work under the direction of the State board of health, and at least 21 State conferences were held at which representatives of the State boards met with those from the Y. M. C. A. and other educational organizations interested in work with boys. The "Keeping-Fit" pamphlet for boys was revised, and the exhibit changed to accord with suggestions made. Much time and effort have been devoted to working up an edition of the exhibit for use with colored boys. The Y. M. C. A. has given the most outside assistance in furnishing personnel and equipment for carrying on the campaign. An association representative has devoted much of his time to training secretaries how to present the exhibit.

The work in the various States began in earnest in January, and special monthly reports have been submitted by 27 of the States in which the campaign was active. During the year approximately 600,000 boys have been reached through about 4,500 showings of exhibits. The following table gives the reports received from 27 States. Several States, notably Minnesota, Mississippi, Nebraska, and Pennsylvania did not render special reports of this work. Reference

should be made to the general report of State activities on page 325 for the work of these States:

State report of "Keeping-Fit" activities, July 1, 1919-June 30, 1920.

State.	Showing of exhibits.					Total attendance.
	Total.	To high school boys.	To employed boys.	To rural boys.	Unclassified.	
United States.....	3,454	1,707	762	427	558	488,976
Alabama.....	43	31	4	8	.....	7,460
Arizona.....	.....	.....	.....	.....	.....	.....
Arkansas ¹	151	124	8	.....	19	13,809
California ¹	91	64	7	.....	20	11,324
Colorado.....	.....	.....	.....	.....	.....	.....
Connecticut.....	.....	.....	.....	.....	.....	.....
Delaware.....	.....	.....	.....	.....	.....	.....
District of Columbia.....	.....	.....	.....	.....	.....	.....
Florida.....	18	11	2	5	.....	632
Georgia.....	43	24	5	1	13	13,182
Idaho.....	.....	.....	.....	.....	.....	.....
Illinois ¹	242	133	85	17	7	51,951
Indiana.....	34	15	8	2	9	15,629
Iowa.....	142	80	54	8	.....	18,895
Kansas.....	55	29	3	2	21	9,208
Kentucky.....	16	12	.....	4	.....	3,225
Louisiana.....	.....	.....	.....	.....	.....	.....
Maine.....	.....	.....	.....	.....	.....	.....
Maryland.....	.....	.....	.....	.....	.....	.....
Massachusetts.....	196	98	95	.....	3	69,127
Michigan.....	76	76	.....	.....	.....	10,317
Minnesota.....	.....	.....	.....	.....	.....	.....
Mississippi.....	.....	.....	.....	.....	.....	.....
Missouri.....	106	56	2	.....	48	15,802
Montana.....	61	61	.....	.....	.....	2,959
Nebraska.....	.....	.....	.....	.....	.....	.....
Nevada.....	.....	.....	.....	.....	.....	.....
New Hampshire.....	.....	.....	.....	.....	.....	.....
New Jersey ¹	76	25	.....	.....	51	8,510
New York.....	635	88	361	123	63	83,765
New Mexico.....	.....	.....	.....	.....	.....	.....
North Carolina.....	139	81	10	24	24	5,631
North Dakota.....	.....	.....	.....	.....	.....	.....
Ohio.....	244	175	28	.....	41	30,934
Oklahoma.....	46	9	3	.....	34	22,499
Oregon.....	186	78	.....	36	72	8,622
Pennsylvania.....	.....	.....	.....	.....	.....	.....
Rhode Island.....	.....	.....	.....	.....	.....	.....
South Carolina ¹	72	21	9	42	.....	9,131
South Dakota ¹	24	20	.....	2	2	2,052
Tennessee.....	.....	.....	.....	.....	.....	.....
Texas.....	103	77	24	2	.....	25,760
Utah.....	10	10	.....	.....	.....	930
Vermont.....	.....	.....	.....	.....	.....	.....
Virginia.....	.....	.....	.....	.....	.....	.....
Washington.....	.....	.....	.....	.....	.....	.....
West Virginia.....	139	70	24	22	23	11,375
Wisconsin.....	502	235	30	129	108	35,892
Wyoming.....	4	4	.....	.....	.....	355

¹ Included in State report of educational activities.

An analysis of the table shows that 49 per cent of the showings were given to high school boys, 22 per cent to employed boys, and only 12 per cent to rural boys. Work with boys in industry has been developed particularly in New York State where 361 or 57 per cent of the meetings held were for employed boys. Rural work has been best developed in New York and Wisconsin. Generally speaking, however, the work with boys in rural and industrial fields has been scarcely touched.

College fraternities.—Approximately 2,200 college fraternity chapters were asked to cooperate in controlling venereal diseases by instructing their freshman initiates in the problems of sex and venereal diseases. Replies were received from 28 per cent of the chapters.

Requests for exhibits were received from 443 chapters. The plan for giving sex instruction was definitely adopted by 275 chapters. One fraternity at its annual convention pledged all of its chapters to cooperation in the program outlined. A special article was sent to fraternity periodicals. Two-thirds of those receiving it agreed to publish it, and many in addition to doing so have given the work special indorsement through their editorial columns.

Women and girls.—A conference to which representatives of the leading women's organizations of the country were invited was held in the fall, and plans for securing closer cooperation were discussed. Representatives of the service were present at the national conventions of the League of Women Voters and the General Federation of Women's Clubs. Resolutions indorsing programs for action leading to the prevention and control of venereal diseases were passed by both organizations.

The National Congress of Mothers and Parent-Teacher Associations and the Parents Association were reached through articles published in the official publications of these organizations. An effort was made to develop a program for use with the Girl Scouts, and experimental meetings were held with the scout captains of the District of Columbia.

Work with the colored population.—The preparation of the "Keeping-Fit" exhibit for colored boys has been mentioned. Colored lecturers have been assigned for duty under the direction of State boards of health. Intensive work has been done by these representatives in North Carolina and Florida and in parts of other States. A total of 176 lectures with an attendance of 29,214 has been given by these men. Reports of this work are included in the general reports of activities from the States, page 325. In addition 65 other addresses have been made by service representatives to colored audiences with an attendance of 19,080. Among the organizations addressed are:

National Negro Business League, including the National Negro Press Association and National Negro Bar Association.

National Medical Association.

National Association of Colored Graduate Nurses.

Interstate Dental Association.

National Association for the Advancement of Colored People.

Supreme Lodge of Pythias.

Grand Lodge of Elks.

International Convention of Y. M. C. A.'s.

The "Healthmobile."—The American Red Cross appropriated \$10,000 to the American Social Hygiene Association for the creation of a motor-truck exhibit. The car as completed contains motion-picture equipment, a darkening apparatus whereby any schoolhouse or other buildings can be properly dimmed, and a generator with a lighting plant, which furnishes power for the motion-picture machine motor and for house lights. A trial trip is to be made in North Carolina under the auspices of the State board of health and the Public Health Service. The personnel to be used will be an advance man, a lecturer, and an operator and driver.

LAW-ENFORCEMENT MEASURES.

The law-enforcement activities of the division during the past year have been concerned largely with giving legal advice to the States in

connection with the enforcement of the laws governing the control of venereal diseases, and the suppression of prostitution as a public-health measure. Much time has been devoted by the division director of legal measures to the rating of the city schedules and to an analysis of the law-enforcement data given for each city. By judicious use of these data it is hoped to stimulate action for better enforcement of laws in the cities graded.

STATE LAWS.

The State appropriations entitling them to receive Federal funds were discussed on page 299. Regular legislative sessions were held in only a few of the States during the past year, with the result that little anti-venereal disease legislation was enacted. The program of model laws was presented in the States which held sessions, but failed of passage in several cases. The following table analyzes the 1920 legislation of which the division has received a report, with the exception of the regular appropriation bills:

Analysis of venereal-disease-control legislation enacted, by States, July 1, 1919-June 30, 1920.

State.	Vice repressive act.	Injunction and abatement act.	Venereal-disease-control act.	Women's prison farm act.	Act prohibiting sale of venereal-disease nostrums.	Act prohibiting advertisement of venereal disease nostrums.	Venereal disease bar to marriage act.	Other venereal-disease-control legislation. ¹
United States..	3	1	3	3	1	3	3	6
Alabama.....	×	.....	×	.....	×	×	×	.....
Georgia.....	.....	.....	.....	×	.....	.....	.....	×
Kentucky.....	×	.....	.....	.....	.....	.....	.....	×
Maryland.....	×	.....	.....	.....	.....	.....	.....	.....
Massachusetts.....	.....	.....	.....	.....	.....	×	.....	.....
Mississippi.....	.....	.....	.....	×	.....	.....	×	×
New Jersey.....	.....	.....	×	.....	.....	.....	×	.....
Oregon.....	.....	.....	.....	.....	.....	×	.....	×
Pennsylvania.....	.....	.....	.....	.....	.....	.....	.....	.....
Rhode Island.....	.....	×	.....	.....	.....	.....	.....	.....
South Carolina.....	.....	.....	.....	×	.....	.....	.....	×
Utah.....	.....	.....	.....	.....	.....	.....	.....	×
Virginia.....	.....	.....	×	.....	.....	.....	.....	.....

¹ Does not include appropriations made to secure Federal funds

The special legislation is of particular interest. Georgia and Mississippi both included in their appropriation bills \$100,000 for institutions for the feeble-minded. Kentucky raised the age of consent of both sexes to 18 years. Oregon made the following special appropriations: \$33,500 for the support of homeless, neglected, abused children, foundlings, and indigent orphans under 17 years; \$7,000 for the support of wayward girls 12 to 18 years of age and for the care of venereals under 21 years; \$2,000 for the aid of the Florence Crittenton Home; and other minor appropriations. South Carolina passed a law providing for the sanitary inspection and conduct of hotels, and placing the control of the work in the hands of the State board of health. Utah appropriated \$20,000 for a prison farm, should the State treasury warrant the expenditure. This appropriation was not available in 1920.

Two States, Alabama and Virginia, passed venereal-disease-control laws. An analysis of these laws shows that the statutes of both

States declare syphilis and gonorrhea dangerous to the public health, declare it unlawful for an infected person to expose another person to infection, require physicians and health officers to report cases of venereal diseases by number, require physicians to give patients circulars of information about venereal diseases, authorize the examination of persons suspected of being infected, and give power to health officers to quarantine infected persons when necessary to protect the public health. In addition, the Alabama law prohibits the sale of drugs for the treatment of venereal diseases except on a physician's prescription, requires that persons confined in prison be examined and treated for venereal diseases, requires persons to receive treatment at their own or public expense, and makes it the duty of health officers to suppress prostitution as the source of the spread of venereal diseases. The Virginia law requires druggists to report the sale of venereal-disease nostrums.

CITY ORDINANCES.

The State boards of health report the passage of 102 city ordinances providing for the control of venereal diseases and the suppression of prostitution. New York State reports 38 and Indiana 19. Extensive use has been made of the model ordinances drafted by the division in 1919 for the use of cities.

LEGAL ADVICE.

Numerous briefs and digests of laws with legal opinions and interpretations have been compiled in reply to queries received from the various States.

ANALYSIS OF THE CITY LAW-ENFORCEMENT ACTIVITIES.

To determine what the States and cities are actually doing in enforcing existing laws and ordinances and in providing new legislation, a study has been made of the reports made on 460 of the cities graded. In considering the various points the cities were given credit for State laws where they existed. The following is a summary of the analysis made:

	Num- ber.	Per cent.
1. Cities tabulated	460	0
2. Cities in which venereal diseases are reportable by law	379	82
3. Cities in which prosecutions for non-report have been made	11	2
Percentage of those requiring reporting	---	3
4. Cities in which the sale of venereal-disease nostrums is prohibited by law	122	27
5. Cities in which the sale of venereal-disease nostrums is reportable by law	102	22
6. Cities in which the advertising of venereal-disease nostrums is prohibited by law	278	60
7. Cities having a dance hall regulating ordinance	198	43
8. Cities having a taxicab-regulating ordinance	185	40
9. Cities having a hotel-licensing ordinance	119	26
10. Cities in which prostitution is prohibited by law	361	79
11. Cities having a red-light district	6	1
12. Cities having known houses of prostitution	108	24
13. Cities having known houses of prostitution in which prostitution is prohibited by law	92	20
Percentage of those having open houses	---	90
14. Cities having police detailed to suppress prostitution	100	22
15. Cities having police detailed to suppress prostitution and known houses of prostitution or red-light districts	22	5

	Num-ber.	Per cent.
16. Cities instructing police in venereal-disease control and source	116	25
17. Cities instructing police and having known houses or red-light districts	23	5
18. Cities having police detailed to suppress prostitution and giving them instruction in venereal-disease control and source	40	9
19. Cities having police detailed to suppress prostitution and giving them instruction, and having known houses or red-light districts	13	3

The tables from which this summary was made follow:

Report by States of legislative and law-enforcement activities of cities in the first grading.

State.	Cities graded.	Cities in which venereal diseases are reportable by law	Cities in which prosecutions for non-report have been made.	Cities in which sale of venereal disease nostrums is prohibited by law.	Cities in which sale of venereal disease nostrums is reportable by law.	Cities in which advertising of venereal disease nostrums is prohibited by law.	Cities having advance hall-regulating ordinance.	Cities having a taxi-cab-regulating ordinance.	Cities having a hotel licensing ordinance.
United States	460	379	11	122	102	278	198	185	119
Alabama	5	5		5		5	1	4	2
Arizona	0								
Arkansas	5	5	1	5			1	1 ¹	1 ²
California	18	18	1		1	18	16-1	5-1 ²	7-1 ²
Colorado	3	3	1	3		3	3		1
Connecticut	17	17					3	7	
Delaware	1	1				1			
District of Columbia	1								
Florida	5	5		2			1	3	3-1 ¹
Georgia	8	8					2	8	3
Idaho	1					1	1	1	1
Illinois	27	27		4	27	7	11	3	2
Indiana	20	20		6		11	3		
Iowa	11	11	2		11	11	6	1	1
Kansas	10	10			7	2	2	5-1	2-1 ²
Kentucky	7	7			7	7	1	1	
Louisiana	4	4		4			1	2	
Maine	5	5					2		
Maryland	3	3			3		1	1	1
Massachusetts	41	41	1		2	41	8	4	41
Michigan	13	13	1	13		13	7-1	1	2
Minnesota	6	6		6		6		2	4
Mississippi	4	4			1		2	1	
Missouri	7	7			3	3	4	3	2-1 ³
Montana	3	3			3		2		3
Nebraska	2	2	1			2	1-1	1	
Nevada	1					1			
New Hampshire	3	3					1		
New Jersey	27	27			2	2	9	3	2
New Mexico	1	1							1
New York	36	6		36		36	25	36	3
North Carolina	7	7		3	4	3	2	4	2
North Dakota	2	2		2			2	1	
Ohio	29	29					7-1	29	1-1
Oklahoma	7	7		7		7	2	3	1
Oregon	2	2		2		2	2	1	2
Pennsylvania	48			2	2	48	30-1	5	1
Rhode Island	7	7					1 ²	7	1
South Carolina	4	4						3	1 ³
South Dakota	2	2			2		2		
Tennessee	5	5			1			2	1
Texas	10	10			10	10	3	5	4
Utah	2	2		2		2	2	2	2
Vermont	2	2					1	2	
Virginia	8	8	2	1	7	8	1	5	1
Washington	8	8			8	8	8	4	6
West Virginia	6	6	1	6		6	1		1 ²
Wisconsin	15	15		15		15	10	15	
Wyoming	1	1							

¹ Ordinance inadequate.

Report by States of legislative and law enforcement activities of cities in the first grading.

State.	Cities graded.	Cities in which prostitution is prohibited by law.	Cities having open red light districts.	Cities having known houses of prostitution.	Cities in which prostitution is unlawful, having known houses or red light districts.	Cities having police detailed to suppress prostitution.	Cities instructing police in venereal disease control and source.
United States.....	460	361	6	108	92	100	116
Alabama.....	5	5				2	
Arizona.....	0						
Arkansas.....	5	5		1	1	1	1
California.....	18	9				9	5
Colorado.....	3	3				1	
Connecticut.....	17	17		1	1	2	1
Delaware.....	1	1		1	1		1
District of Columbia.....	1	1				1	1
Florida.....	5	5	1		1	2	1
Georgia.....	8	8	1	1	1	2	1
Idaho.....	1	1				1	
Illinois.....	27	27		14	14		1-1
Indiana.....	20	13		3	2	5	5
Iowa.....	11	11	1	7	8		3
Kansas.....	10	9				1	1
Kentucky.....	7	7		5	5	1	
Louisiana.....	4	4		2	2	2	
Maine.....	5	5		4			1
Maryland.....	3	3		2	1	1	2
Massachusetts.....	41	2		1		5	22
Michigan.....	13	13		1	1	8	5
Minnesota.....	6	6		5	5	2-1	3
Mississippi.....	4	4		3	3		1
Missouri.....	7	7		7	7	2	1
Montana.....	3	3					2
Nebraska.....	2	2		1	1		
Nevada.....	1		1				
New Hampshire.....	3	3					3
New Jersey.....	27	12		3	1	6	1
New Mexico.....	1	1					
New York.....	36	36		2	2	13	11
North Carolina.....	7	7		3	3		3
North Dakota.....	2	2					1
Ohio.....	29	29		17	17	5	3
Oklahoma.....	7	6				3	
Oregon.....	2	2		1	1	1	2
Pennsylvania.....	48	30	1	7	5	6	9
Rhode Island.....	7	7				1	3
South Carolina.....	4	4		1	1		3
South Dakota.....	2	2					
Tennessee.....	5	5		1	1	2	2
Texas.....	10	10		2	1	4	3
Utah.....	2	2				1	2
Vermont.....	2	2					2
Virginia.....	8	4		5	1	6	4
Washington.....	8	8				5	3
West Virginia.....	6	3		5	3		
Wisconsin.....	15	15		2	2	1	
Wyoming.....	1		1				1

¹ Ordinance inadequate.

In order to classify the States according to existing legislation and effectiveness of law enforcement, they were grouped in five classes.

Class A States had the following qualifications:

1. Reporting of venereal diseases required by law.
2. Sale of venereal-disease drugs either reportable or prohibited by law.
3. Advertising of venereal-disease drugs prohibited by law.
4. Prostitution prohibited by law.
5. No red-light districts or known houses of prostitution in cities graded.

Four States qualified for class A.

Class B States had the following qualifications:

1. Reporting of venereal diseases required by law.
2. Sale of venereal-disease drugs either reportable or prohibited by law.
3. Prostitution prohibited by law.
4. No red-light districts.
5. Known houses of prostitution in not more than one out of five of cities graded.

Eight States qualified for class B.

Class C States met the following requirements:

1. Reporting of venereal diseases required by law.
2. Prostitution prohibited by law.
3. No red-light districts.
4. Known houses of prostitution in not more than one out of three of cities graded.

Nine States met class C requirements.

Class D requirements are as follows:

1. Venereal-disease reporting law or approved substitute.
2. Prostitution prohibited by city ordinance in one-half of cities graded.
3. Not more than one red-light district.
4. Known houses of prostitution in not more than one-half of cities graded.

Eleven States met these requirements.

The remaining 15 States were placed in class E.

This study is of value because it shows not only that present legislation is inadequate in many States and cities, but also that the laws which do exist are not being enforced. If the ratings of the cities are to be raised at the next grading, it will be necessary for health officers and interested organizations, as well as individual citizens, throughout the country to arouse the public conscience so that the people will demand the passage and enforcement of adequate laws. Legislative and law-enforcing machinery is available; all that is needed is a public demand for action, a demand so strong that it can not be ignored.

THE GRADING OF THE CITIES.

Inasmuch as the survey of the 467 cities with a population of 15,000 and over covers all phases of the program for controlling venereal diseases, it has been thought best not to include it under any one of the three lines of activity but to give it special attention.

The immediate purpose of the survey was to determine what measures to control venereal diseases each city was using on February 1, 1920, and to grade the city on the effectiveness of the measures in force. The ultimate purpose of the survey was to stimulate in city and State officials a greater interest in the problem of venereal-disease control, and through them to develop a public-health conscience which will demand more effective measures in each of the cities graded in order that in subsequent surveys better ratings may be secured.

Before making the survey the approval of the State health officers was secured, and the venereal-disease-control officer of each State was invited to accompany the officer making the survey. The division detailed for this work all the regional consultants and others loaned from other branches of the service, a total of 13 officers. The survey was begun in February and continued through June. Questionnaires

containing 180 questions were made out for each city. The following is an outline of the points covered:

- I. Medical measures:
 - A. Clinics—
 - (1) Location.
 - (2) Equipment.
 - (3) Personnel.
 - (4) Treatment.
 - (5) Management.
 - (6) Community standing.
 - B. Reporting of venereal diseases—
 - (1) How and to whom reports are made.
 - (2) Use made of data on reports.
 - (3) Extent to which physicians are submitting reports.
 - C. Sale of nostrums—
 - (1) Reporting of sales of nostrums.
 - (2) Advertising of nostrums.
 - D. Miscellaneous medical measures—
 - (1) Attitude of medical men toward clinic.
 - (2) Examination of sex offenders.
 - (3) Legal procedure and its relation to examination and treatment of venereal diseases.
 - (4) Institutions for feeble-minded.
- II. Educational measures.
 - A. Use of placards and pamphlets.
 - B. Lectures, motion-picture, and exhibit showings.
- III. Legal measures.
 - A. Ordinances for suppressing prostitution.
 - (1) Prohibiting prostitution.
 - (2) Regulating dance halls.
 - (3) Licensing taxicabs and for-hire automobiles.
 - (4) Licensing hotels and rooming houses.
 - B. Ordinances controlling venereal diseases.
 - (1) Requiring reporting of venereal diseases.
 - (2) Prohibiting sale or advertisement of nostrums.
 - C. Quarantine regulations.
 - D. Attitude of officials toward enforcement of laws.
 - E. Machinery for law-enforcement.
 - (1) Extent.
 - (2) Efficiency.

The officer making the survey was instructed to secure his information through the following officials: City health officer, director of the clinic, clinician, city attorney, judge of the municipal court, chief of police.

The schedules were sent to the division where a corps of workers from all sections was detailed to grade them. Each city was rated on the basis of 1,000 points. The survey was completed and the grades assigned before the close of the fiscal year. The results, that is, a list of the cities and their grades, will be published in the form of a graph early in the summer.

A systematic plan of follow-up has been developed, by which a series of letters is to be sent to the mayors in the cities graded through the State health officer. In a similar way it is hoped to secure the cooperation of various civic, social, and industrial organizations. Health officers for the most part favor such a plan for follow-up work. One venereal-disease-control officer writes:

I think the plan an excellent one, and for a stimulative educational program for the group selected, I hardly see how it could be improved upon. The idea of bombarding the municipal officers, who should know more about venereal diseases, at stated intervals, is a good health-business move as well as a powerful psychological message.

The mayors are also putting themselves on record as favoring more efficient action. One city executive writes:

I am naturally opposed to a red light-district, and none will be tolerated in this city while I am the executive head. I am in full accord with the stand taken by the State Department of Health as outlined in the pamphlet you inclosed.

The value of the survey to the general program lies in the definiteness which has been given to the work as a result of the data accumulated. The study of the 359 clinics surveyed has already been reported, also the study of the law-enforcement data submitted. It is in the cities of the country, however, that the nation-wide program for combating venereal diseases will be tried out, and it is only through surveys such as the one just completed that its practicability and effectiveness can ultimately be determined.

STATISTICAL SUMMARY.

The following table summarizes all the activities in venereal-disease control for the past two years, 1919 and 1920:

Statistical summary of activities in the control of venereal diseases, comparative table showing the fiscal years 1919 and 1920.

	1919	1920
<i>Medical activities.</i>		
I. Cases of venereal diseases reported to State boards of health:		
A. Gonorrhea.....	131,193	172,387
B. Syphilis.....	100,466	142,869
C. Chaneroid and others.....	7,843	10,861
Total.....	239,502	326,117
II. Doses of arsphenamine (or similar product) administered by State boards of health.....	¹ 118,055	328,382
III. Clinics:		
A. Clinics operating under joint control of State boards of health and the Public Health Service.....	237	427
B. Clinics included under A established during the year.....	145	190
C. Clinics reporting activities.....	167	383
D. Reports received from clinics—		
(1) Patients admitted.....	59,092	126,131
(2) Patients discharged as non-infectious.....	6,922	34,215
(3) Treatments given.....	527,392	1,576,542
(4) Wassermann tests made.....	63,929	175,872
(5) Microscopic examinations made for gonococcus infection...	89,419	155,275
<i>Educational activities.</i>		
I. Pamphlets:		
A. Requests for pamphlets received—		
(1) By the Public Health Service from—		
(a) Individuals.....	48,855	41,617
(b) Public officials and organizations.....	26,877	6,491
(c) Industries and commercial organizations.....	1,566	8,211
Total.....	77,298	51,319
(2) By State boards of health from—		
(a) The Public Health Service for compliance.....	19,032	32,519
(b) The public.....	174,683	103,515
Total.....	193,715	136,034
(3) Gross total requests for pamphlets received.....	271,013	187,353
Minus requests received by State boards of health from the Public Health Service.....	19,032	32,519
(4) Net total requests for pamphlets received.....	251,981	154,834

¹ The total (353,054) reported in 1919 was an error.

Statistical summary of activities in the control of venereal diseases, comparative table showing the fiscal years 1919 and 1920—Continued.

	1919	1920
<i>Educational activities—Continued.</i>		
I. Pamphlets—Continued.		
B. Pamphlets distributed—		
(1) By the Public Health Service.....		
(a) In response to requests from—		
(1a) Individuals.....	422,961	108,332
(2a) Public officials and organizations.....	2,666,070	403,126
(3a) Industries.....	224,793	100,667
(b) Directly to—		
(1a) The public (official mailing lists and general circularizations).....	² 2,183,655	³ 982,334
(2a) State boards of health.....	831,029	667,534
(3a) States in draft campaign.....	3,143,700	
(4a) Public Health Service field officers.....	242,658	52,687
(5a) Other field agencies.....	405,906	
Total.....	10,120,772	2,314,680
(2) In the field by—		
(a) State boards of health.....	5,817,042	6,488,333
(b) States in draft campaign.....	2,286,912	
(c) Clinics.....	131,009	
Total.....	8,234,963	6,488,333
(3) Gross total pamphlets distributed.....	18,355,735	8,803,013
Minus pamphlets distributed by the Public Health Service to—		
(a) State boards of health.....	831,029	667,534
(b) States in draft campaign.....	3,143,700	
(c) Public Health Service field officers.....	242,658	52,687
Total subtracted.....	4,217,387	720,221
(4) Net total pamphlets distributed.....	14,138,348	8,082,792
C. Framed placards posted.....	64,892	
D. Pamphlets purchased and reprinted by State board of health.....	10,510,524	5,816,830
E. Pieces of the industrial program purchased.....	668,668	186,588
F. Different educational venereal-disease pamphlets issued by the Public Health Service.....	50	5
II. Lectures and addresses:		
A. Lectures and addresses reported.....	⁵ 428 ⁶ 7,210 ⁷ 654	⁵ 563 ⁶ 11,797 ⁷ 206
Average attendance.....	⁵ 220 ⁶ 181 ⁷ 444	⁵ 206 ⁶ 131 ⁷ 92
B. Meetings under A at which films or exhibits were shown.....	⁵ 74 ⁶ 627 ⁷ 70	⁵ 92 ⁶ 429 ⁷ 71
C. Meetings under A at which resolutions were adopted.....		
D. State board of health meetings under A included in Public Health Service report, deducted from total.....	83	
E. Total lectures and addresses reported.....	8,209	12,360
Average attendance.....	201	134
III. Conferences reported by the Public Health Service.....	16	25
Average attendance.....	184	188
Conferences at which resolutions were adopted.....	16	22
IV. Exhibits and lantern slides:		
A. Exhibits and slides loaned by the Public Health Service to—		
(1) State boards of health.....	441	45
(2) Public Health Service officers.....	10	
(3) Y. M. C. A.'s.....	59	13
(4) Others.....	41	72
Total.....	551	130
B. Exhibits and slides purchased by—		
(1) State boards of health.....	125	653
(2) Y. M. C. A.'s.....	78	⁴ 10
(3) Others.....	18	13
Total.....	221	676

² Includes 653,720 pieces of the industrial program.³ Includes 403,168 pieces of the industrial program.⁴ Reports incomplete.⁵ Public Health Service.⁶ State boards of health.⁷ Clinics.

Statistical summary of activities in the control of venereal diseases, comparative table showing the fiscal years 1919 and 1920—Continued.

	1919	1920
<i>Educational activities—Continued.</i>		
IV. Exhibits and lantern slides—Continued.		
C. Exhibit and lantern slide showings reported	⁵ 888	⁵ 26
Average attendance	⁸ 1,716	⁶ 11,007
D. State board of health showings under C included in Public Health Service report, deducted from total	⁵ 302	⁵ 649
E. Total showings reported	⁶ 223	⁶ 206
Average attendance	418	.....
	2,186	11,033
	255	207
V. Motion-picture films:		
A. Motion-picture films loaned by the Public Health Service to—		
(1) State boards of health	21	1
(2) Others	384	3
Total	405	4
B. Motion-picture films purchased by State boards of health	65	55
C. Motion-picture showings reported	⁵ 275	⁵ 241
Average attendance	⁶ 1,134	⁶ 1,916
D. State board of health showings under C included in Public Health Service report, deducted from total	⁵ 522	⁵ 338
E. Total showings reported	⁶ 555	⁶ 313
Average attendance	11	.....
	1,398	2,157
	549	320
VI. Publicity material:		
A. Articles furnished magazines	3,228	302
B. Periodicals containing articles received	157	118
C. Circulation of articles published	4,470,756	3,190,786
<i>Law-enforcement activities.</i>		
I. States qualifying for Chamberlain-Kahn funds	46	46
II. States enacting legislation for venereal-disease control	40	⁸ 13
III. City ordinances for venereal-disease control	222	102
<i>City-grading activities.</i>		
I. Cities graded		467

⁵ Public Health Service.

⁶ State boards of health.

⁸ This does not include States making appropriations entitling them to Federal allotment.

GENERAL INSPECTION SERVICE.

With the enlargement of the hospital facilities of the Public Health Service to take care of the increased number of beneficiaries of the War Risk Insurance Bureau, complaints regarding the administration of hospitals and the personal conduct of officers of this service began to be received in the bureau to a considerable extent. Although the Public Health Service has previously assigned inspectors to the field to investigate reports of mismanagement, it was felt that only by the establishment of an independent inspection service reporting directly to the Surgeon General could the maximum efficiency be hoped for in the administration of all service activities. Accordingly, on February 16, 1920, upon the recommendation of the Surgeon General of the Public Health Service, an inspection section of the Public Health Service was created with a commissioned medical officer of this service holding the rank of Assistant Surgeon General in direct charge. Later, in pursuance of the authority contained in the Service Regulations, approved by the President on August 29, 1920, the Inspection Section became the General Inspection Service.

In addition to a corps of special inspectors located in Washington, D. C., it was found necessary to establish zone inspectors in the field in order to systematically and efficiently cover the vast activities of the service throughout the country. The United States, for inspection purposes, has been divided into zones comprising a number of States each, and a zone inspector has been detailed to duty in each of these zones. This zone inspection service has been recently organized, and at the present time 9 of the 14 districts are covered, and within the near future the one remaining zone in the eastern portion of the United States will receive a similar detail.

It is the duty of the inspectors of this service to make routine inspections of both Government-owned and contract hospitals and all other stations and activities of the service. In addition to these routine inspections, every complaint which is received in the bureau regarding mismanagement or the lack of proper medical or hospital facilities receives the personal attention of an inspector, who takes testimony under oath to ascertain the truth of the charges, making a report in writing to the Surgeon General on which that official can base necessary action toward remedying the conditions disclosed. From the date of the creation of the Inspection Service up to the close of the fiscal year, a period of a little over four months, the following inspections have been made by this section:

January 1, 1920, to June 30, 1920, inclusive.

Number of hospitals, first class, inspected.....	51
Number of contract hospitals and second-class stations inspected.....	832
Number of special investigations completed.....	123
Number of annual inspections of unserviceable property.....	18

The salutary effect upon the administration of the service activities, by having frequent and impartial inspections made, already manifests itself in increased efficiency. The work of the Inspection Service at the time of its creation, or in the early days of its existence, was extremely heavy; but at the present time complaints of the lack of care and treatment are largely diminishing in number, and it has even been found possible, therefore, to devote more time to routine inspections.

SECTION OF PUBLIC HEALTH EDUCATION.

Among the new activities successfully carried on by the Section of Public-Health Education during the past year was the inauguration of a daily health column supplied for publication in newspapers throughout the country. Combined with a system of questions and answers, this has met with a very cordial reception by the public, and has been an effective vehicle for the promotion of public-health education.

Through the medium of the Foreign Language Information Bureau, originally a part of the Committee on Public Information, the foreign-language press has been furnished with a series of authoritative health articles which have been extensively utilized by these newspapers. This work has undoubtedly been of great value in educating alien immigrants in the work of American institutions.

Owing to the restrictions imposed on Government bureaus in regard to publications, it has been impossible to continue supplying Members of Congress with public-health bulletins for distribution to their constituents. So far as one of the publications is concerned, the Health Almanac for 1920, a large supply for distribution was made available through the kindness of the American Red Cross.

Efforts made by the section to find a permanent place in Washington for displaying the health exhibit originally shown at the Panama Exposition were unavailing, and the exhibit was finally sent to the bureau's station in Perryville for use in the local health office there.

In cooperation with the United States Reclamation Service, the Bureau of Fisheries, and the American Museum of Natural History, the section succeeded in producing an educational motion picture dealing with mosquitoes and malaria. Copies of this picture have been made available for State and local health officers and others interested in this important health problem.

Toward the end of the fiscal year an extensive revision of the bureau's various mailing lists was undertaken, a proceeding which effected a considerable saving in publications through a reduction in the number of names on the mailing lists.

The limitation in the number of copies of bulletins which may be printed by Government bureaus has made it necessary also to discontinue publishing the "Monthly List of Publications."

During the fiscal year ending June 30, 1920, 53 new publications were issued, compared with 161 during the preceding year. The total number of copies of these publications and of reprints of previous documents aggregated 5,806,220, as compared with 9,532,392 copies during the preceding fiscal year, and with 4,364,850 the year before that. This number of leaflets sent in response to public

requests is entirely additional to the publications printed and distributed by the Division of Venereal Diseases.

The section has administered the stereopticon loan library, sending out lantern slides to the amount of 5,357 in response to 89 requests. The demand has very greatly exceeded the number of slides available, and there have been no available funds to make additions to the library.

The work of the section is hampered by the lack of funds for developing important educational activities by means of lectures, exhibits, posters, motion pictures, and other recognized vehicles of public-health education.

PURVEYING SERVICE.

On account of the greatly increased amount of work in connection with the purchase, care, and issue of property, which naturally accompanied the great increase in the number of beneficiaries of the service and the opening of new hospitals, together with the fact that the Purveying Depot purchased for other divisions of the bureau, it was deemed advisable to separate the Purveying Depot from the Marine Hospital Division and make it an independent section responsible direct to the Surgeon General. This was brought about on April 9, 1920, with the approval of the Secretary of the Treasury.

Within the last year the activities and the personnel of the Purveying Depot have increased manyfold, and in order to carry on the work expeditiously the Purveying Depot was reorganized and divided into certain logical sections, the whole in charge of a commissioned medical officer of the service, with a pharmacist as an assistant and executive officer.

These sections are as follows:

Purchase and issue section.

Financial section.

Dental section.

Motor transportation section.

X-ray section.

Property returns section.

Supply depot at Perryville.

Supply depot at North Chicago.

The main supply depot is located at Perryville, Md., and is in charge of a pharmacist of the service. At Perryville is stored most of the stock owned by the Public Health Service, either through purchase or by transfer from the Army and Navy and reissued to the various stations of the service. Within the last year an enormous amount of property has gone in and out of Perryville, requiring a large amount of storage space and adequate receiving and shipping facilities, in addition to facilities for repairing or placing in good condition articles before they are issued.

In addition to the supply depot at Perryville, there is also another smaller one at North Chicago, occupying those buildings at Camp Lawrence which were transferred by the Navy Department to the Public Health Service.

The other sections, which together form the head office of the Purveying Depot, are all located in Washington, D. C. At the present time, except for office furniture secured from the General Supply Committee, which is received, crated, and immediately shipped, no stock is kept or issued from Washington.

The following tabulations will indicate statistically the transactions of the purveying section:

Summary of transactions of the Purveying Depot during fiscal year ending June 30, 1920.

Requisitions filled.....	5,584
Packages shipped from Purveying Depot.....	14,815
Packages shipped from one station to another.....	3,211
Orders placed for direct shipment of supplies to field stations.....	5,586

Supply depot, Perryville, Md.

Packages shipped	17, 526
Total weight of supplies shipped	2, 674, 933

Expenditures of the Purveying Depot for fiscal year 1920, classified by subject matter.

1. Drugs and chemicals.....	\$137, 758. 94	11. Bedding, clothing and towelings.....	\$113, 658. 68
2. Surgical instruments and appliances.....	18, 757. 03	12. Hardware, plumber's sup- plies, lumber.....	95, 577. 44
3. Hospital furniture and equipment.....	483, 119. 00	13. Books and journals.....	6, 713. 26
4. Quarter's furniture and equipment.....	100, 478. 32	14. Dental supplies.....	173, 776. 81
5. Office furniture and sup- plies.....	181, 156. 53	15. Physio-therapy.....	58, 918. 61
6. Typewriters and adding machines.....	88, 929. 36	16. Occupational therapy.....	58, 281. 00
7. Hospital supplies.....	102, 160. 80	17. Prosthetic and orthopedic.....	3, 635. 25
8. X-ray supplies and equip- ment.....	60, 084. 71	18. Auto vehicles and acces- sories.....	162, 494. 39
9. Laboratory supplies and equipment.....	89, 614. 71	19. Electrical supplies.....	63, 361. 87
10. Kitchen and dining-room equipment.....	283, 455. 25	20. Live stock.....	34, 024. 31
		21. Miscellaneous.....	78, 218. 08
		Total.....	2, 394, 174. 35

Operating expenses of purveying depot for fiscal year 1920.

OFFICE EXPENSES.

WASHINGTON, D. C.

Salaries of all employees.....	\$88, 799. 40
Ice.....	206. 28
Removal of rubbish.....	24. 00
Telephones.....	70. 07
Electricity.....	255. 42
Equipment (furniture, etc.).....	4, 353. 12
Miscellaneous office supplies, etc.....	7, 156. 37
Motor transportation.....	2, 324. 09
	<hr/> \$103, 188. 75

SUPPLY DEPOT—PERRYVILLE, MD.

Pay, allowances, and commutation :	
Pharmacist in charge.....	2, 740. 00
Clerks, stenographers, etc. (salaried pay roll).....	30, 297. 78
Laborers (per diem or hourly basis).....	117, 689. 53
Office force, including all other employees on annual salary.....	23, 331. 79
	<hr/> 174, 059. 10
Freight, express, and travel expenses :	
Freight.....	102, 909. 56
Express.....	3, 942. 03
Travel expenses.....	301. 28
Demurrage.....	2, 724. 00
	<hr/> 109, 876. 87
Maintenance :	
Gasoline, oils, etc.....	9, 689. 62
Motor repair parts.....	6, 555. 89
Tools and equipment.....	2, 908. 90
Switching cars.....	1, 413. 75
Packing materials.....	507. 79
Gas for welding purposes.....	97. 90
Miscellaneous.....	2, 297. 31
	<hr/> 23, 471. 16
Receiving and shipping supplies (exclusive of motor transport section) :	
Chauffeurs' pay (receiving and shipping).....	4, 911. 19
Other labor, receiving.....	7, 833. 15
Other labor, shipping.....	8, 869. 52
	<hr/> 21, 613. 86

Receiving, shipping, and repairs motor transportation :

Receiving -----	\$3, 009. 28
Assembling -----	6, 006. 51
Repairing -----	9, 266. 00
Painting -----	1, 129. 30
Shipping -----	3, 943. 81

 \$23, 354. 90
Repairs and alterations to buildings, etc. :

Repairing foundation, building No. 60 -----	2, 998. 10
Interior alterations, building No. 60 -----	7, 237. 71
Exterior alterations, building No. 60 -----	267. 60
Constructing annex, rear, building No. 60 -----	638. 90
Constructing annex, front, building No. 60 -----	4, 732. 59
Painting, building No. 60 -----	1, 643. 63
Electrical work, building No. 60 -----	1, 270. 20
Repairs to bunkhouses -----	361. 80
Alterations, building No. 1A -----	63. 92
Alterations, machine shop building -----	5, 972. 89
Building and repairing roads -----	1, 017. 70
Storage, automobiles -----	2, 089. 20
Inventory -----	718. 25
Overhauling fire extinguishers, time clocks, and typewriters -----	319. 25
Miscellaneous -----	64. 84

 29, 396. 58

Total ----- 484, 961. 22

CHIEF CLERK'S OFFICE.

PERSONNEL OF BUREAU.

The continued growth of the service at large made it necessary to add steadily to the number of employees on duty in the administrative bureau in Washington. During the fiscal year the personnel on duty increased from 220 to 529. The field establishment is still growing rapidly, and it is inevitable that the bureau in Washington must continue to enlarge for some time to come.

The work of improving and developing the office organization has more than kept pace with this expansion, and it is gratifying to report that the bureau is now in much better shape to discharge its increasing responsibilities than it was one year ago. The effort in this direction will be continued without relaxation until the bureau is in an entirely satisfactory condition from an administrative standpoint.

BUREAU OFFICE QUARTERS.

The Hospital Division of the bureau has several times outgrown its quarters during the past year, and the resulting removal to other buildings caused some temporary dislocation of its work. However, all parts of the bureau are now concentrated in two buildings, viz, the Butler Building, at New Jersey Avenue and B Streets SE., and Building C, a temporary structure at Seventh and B Streets SW. This is a great improvement over former conditions, which, it is expected, will be reflected in improved economy and efficiency. Nevertheless, it will always be unsatisfactory to have important Government records and activities housed in a building of flimsy and non-fireproof construction. In the event of destruction many of these records could not be replaced, and the resulting confusion and loss would be so serious that the matter is one of constant concern. It is hoped that conditions will soon be such as to make it practicable to submit a recommendation to Congress for an appropriation for a separate, modern, fireproof building for the Public Health Service.

Such a building should be carefully planned with a view to the peculiar needs of the Federal Health Service, and should be expressive of the broad views entertained by the General Government as to the value and importance of the national health organization.

PUBLIC HEALTH LIBRARY.

The bureau library has been recently installed in new quarters, which have added greatly to its usefulness. The extensive work of recataloguing and rearranging has proceeded throughout the year. Many important additions have been made, both by gift and purchase, and the librarian is now engaged in digesting a mass of unorganized material accumulated in former years when the bureau had no library employees. It is expected that many useful and historical documents will be obtained from this source. A further important expansion of the library is under contemplation.

NEEDS OF THE SERVICE.

HOSPITAL ACTIVITIES.

There is still considerable difficulty experienced by the various agencies administering to the wants of ex-service men in the matter of their hospital care because of the lack of coordination. At the present time the Bureau of War Risk Insurance, the Federal Board for Vocational Education, and the Public Health Service are charged by law with certain responsibilities toward this class of beneficiaries. Many of the duties of these three organizations overlap, causing duplication and consequent confusion. It is believed that legislation at the next Congress should be recommended in order to delimit the authority and responsibilities of these agencies, or in some other manner prevent the present duplication and confusion.

FIELD INVESTIGATIONS.

It is deemed highly desirable to recommend that additional appropriation be secured for furthering investigative work of the Public Health Service. The work of the service along these lines has met with success in the past. The necessity for such work by the Public Health Service can be appreciated to some extent when it is remembered that one-fifth of all deaths take place in children less than five years of age; that pneumonia claims one-tenth of all persons who die each year in the United States; that 150,000 deaths are due to tuberculosis; that 7,000,000 or 8,000,000 cases of malaria occur annually, causing an economic loss of about \$800,000,000 to \$1,000,000,000; that the recent epidemic of influenza carried off in the space of six weeks some 500,000 lives. It would seem, therefore, in the interest of national health and prosperity that funds should be appropriated by Congress in increasing amounts to further investigation and prevention of disease.

PLAGUE OPERATIONS.

Plague operations continued throughout the past fiscal year at New Orleans, La., and San Francisco, Calif. Shortly after the close of the fiscal year, and before this report was sent to the printer, a new outbreak of plague occurred in New Orleans. Following the New Orleans outbreak, plague made its appearance in Pensacola, Fla., and in two localities in Texas. Mention is made of these outbreaks because of the necessity of urging at this time that steps be taken at the next session of Congress to secure additional appropriations with which to combat this disease. The epidemic fund at the disposal of the bureau for the purpose of combating this and other

diseases is nearly exhausted, despite the fact that plague operations must be carried on for several more months. The present outbreak of plague in these southern towns is considered by the bureau to present a troublesome problem; and it is urgently recommended that immediate steps be taken to obtain legislative relief from Congress.

IMPROVEMENTS IN THE QUARANTINE SERVICE.

Quarantine facilities at the port of Providence are wholly inadequate for the protection of that port, and on several occasions it has been necessary to remand infected vessels to New York with resulting commercial prejudice to Providence. There should be provided at Narragansett Bay a quarantine station not only for the protection of Providence but for Fall River and various other ports in that vicinity. This plant should have quarters for operating personnel, barracks for cabin passengers, and steerage passengers that are held in detention, small hospital building, necessary utilities, heating and lighting, and provisions for the disinfection of infected vessels and crew or passengers. It is contemplated that such a plant would cost in the neighborhood of \$600,000, including site.

A quarantine station is also required at the port of Mobile, and the Public Health Service has already secured to the Government from the State of Alabama title to 12 acres of land located on an artificial island in Mobile Bay near the mouth of the river. This affords ample space for a modern quarantine station, including detention barracks, quarters for the operating personnel, and disinfecting facilities. There is a quarantine station at present near the mouth of the bay, some 30 miles from Mobile. It is lacking in disinfection facilities, and the provisions for detention of infected cases or contacts are wholly inadequate. The station, moreover, is constructed on piling, which results in a most excessive cost for preservation and repair, and because of its open exposure has on several occasions been severely damaged and at one time was entirely destroyed.

REPORTS OF PREVALENCE OF DISEASE.

One of the functions of the Public Health Service, in addition to preventing the introduction of diseases into the United States, is to prevent the spread of disease from State to State. To efficiently perform this duty, however, it is necessary that the service have complete information of the presence of diseases in the United States. If reports of the presence of diseases are promptly received by the service, State and local authorities throughout the country can be notified of the presence of these conditions and necessary steps taken to prevent interstate epidemics. State authorities throughout the country look to the Public Health Service as the one central agency which is capable of performing this function. Up to the present time, however, the necessary funds have been lacking for collecting and disseminating this information, and the service has not been able to fully meet its responsibilities in this particular. To enable this work to be carried on in a proper manner during the next fiscal year, it is recommended that representations be made to Congress for additional funds for this extremely important work.

EDUCATIONAL MATERIAL.

For a number of years the Public Health Service has, because of inadequate appropriation, necessarily neglected its duty in the matter of publishing and distributing educational material for the use of the public. The existence of certain legislative restrictions, which prohibit the Public Health Service from printing and distributing these documents in sufficient quantities, has also militated against the endeavors of the service to meet its responsibilities in this important public-health field. In addition to printed material, it is necessary, in order to carry the message of public health to the American public, that exhibit material, moving pictures, lantern slides, and posters of various kinds be secured and distributed. State boards of health throughout the country have for years secured appropriations for the purchase of material of this character, and are, in many instances, really in advance of the Federal Public Health Service in matters of this kind. The Federal service is, however, looked to for leadership in matters of this kind; and it is earnestly recommended that additional appropriations be secured from Congress during the next fiscal year to carry on this educational work.

BUREAU QUARTERS.

During the past fiscal year it has been necessary, due to the overcrowding of the offices to move a number of bureau divisions and sections from the Butler Building to other quarters allotted to it by the Public Buildings Commission. At the present time, in addition to the occupancy of the Butler Building, activities of the Public Health Service are housed in a group of the old ordnance buildings located at Seventh and B Streets SW. Due to their flimsy and flammable construction, these quarters are, however, very unsatisfactory. The hospital records of the discharged soldiers are housed in these buildings, and their destruction by fire—a grave possibility in buildings of this type—would cause endless confusion and expense to the Government. It is strongly recommended, therefore, that steps be taken to locate all the activities of the Public Health Service in one building of permanent fireproof construction. With the rapid advance of this service during the last few years, it is believed that this step would prove an economical one for the Government.

NATIONAL HEALTH PROGRAM.

It is again strongly recommended that the estimates presented by the department to meet the needs of the national health program be granted to the farthest possible extent, in order that constructive work along these lines may be carried forward during the next fiscal year.

HOSPITAL FACILITIES.

In October, 1919, the department submitted to Congress a program recommending an appropriation of \$85,000,000 for the construction and acquisition of additional facilities to meet the growing needs of

the service in connection with the care and treatment of war-risk insurance beneficiaries. Congress in its wisdom, however, deemed it inadvisable to appropriate this money for hospital purposes and consequently took no action on this program before adjournment during the summer of 1920. At the time this recommendation was submitted to Congress the facilities of the service for hospitalizing its beneficiaries were very inadequate, necessitating the construction and building of additional hospitals in the amount asked for. Since that date, however, the number of beneficiaries has steadily increased, and recent reports indicate that about 20,000 patients are now receiving hospital care from the Public Health Service, whereas in April of 1919, approximately the time when this recommendation of the department was under consideration by Congress, but 2,000 patients were under treatment by the Public Health Service. The grave necessity for legislation in this matter is therefore apparent.

In addition to increasing existing facilities by the construction of new hospitals, it is desired to bring to the attention of Congress the dilapidated and unsatisfactory condition of many of the hospitals now owned and operated by the Public Health Service. Some of these hospitals have been owned by the Government for years and were used for the treatment of seamen of the merchant marine and other beneficiaries of the service prior to the act which admitted ex-service men of the recent war as beneficiaries. It is presumed that these institutions will be made use of for years to come for these beneficiaries, despite action which Congress might take with reference to the beneficiaries of the War Risk Insurance Bureau. It is therefore necessary that these institutions be placed in first-class condition. All of the marine hospitals at the present time, with but few exceptions, are of antiquated construction and badly in need of repair. But a few years will elapse before it will be necessary to discontinue entirely the use of these institutions, unless steps are taken to reconstruct and remodel the same to meet with modern ideas of hospital construction and management. Recommendations as to the hospital needs for patients of the Bureau of War Risk Insurance will be presented to Congress in a separate communication.

PERSONNEL.

Attention is invited to the urgent necessity for provision by the Congress of legislation which will provide adequate and suitable personnel for the important public health and other duties of the Public Health Service, particularly those involved in furnishing medical and surgical care to ex-service men and women who are patients of the Bureau of War Risk Insurance, trainees of the Federal Board for Vocational Education, patients of the Employees' Compensation Commission, disabled officers and men of the Coast Guard, Coast and Geodetic Survey, and American merchant marine and other beneficiaries of the Public Health Service.

Despite the temporary increase in compensation granted by the Congress during its last session, the Public Health Service, in common with the Medical Corps of the Army and Navy, finds it impossible to secure candidates for admission to the entrance grade of its regular corps, and the attractions offered its scientific personnel are

such that the resignations have actually exceeded the admissions during the past 12 months.

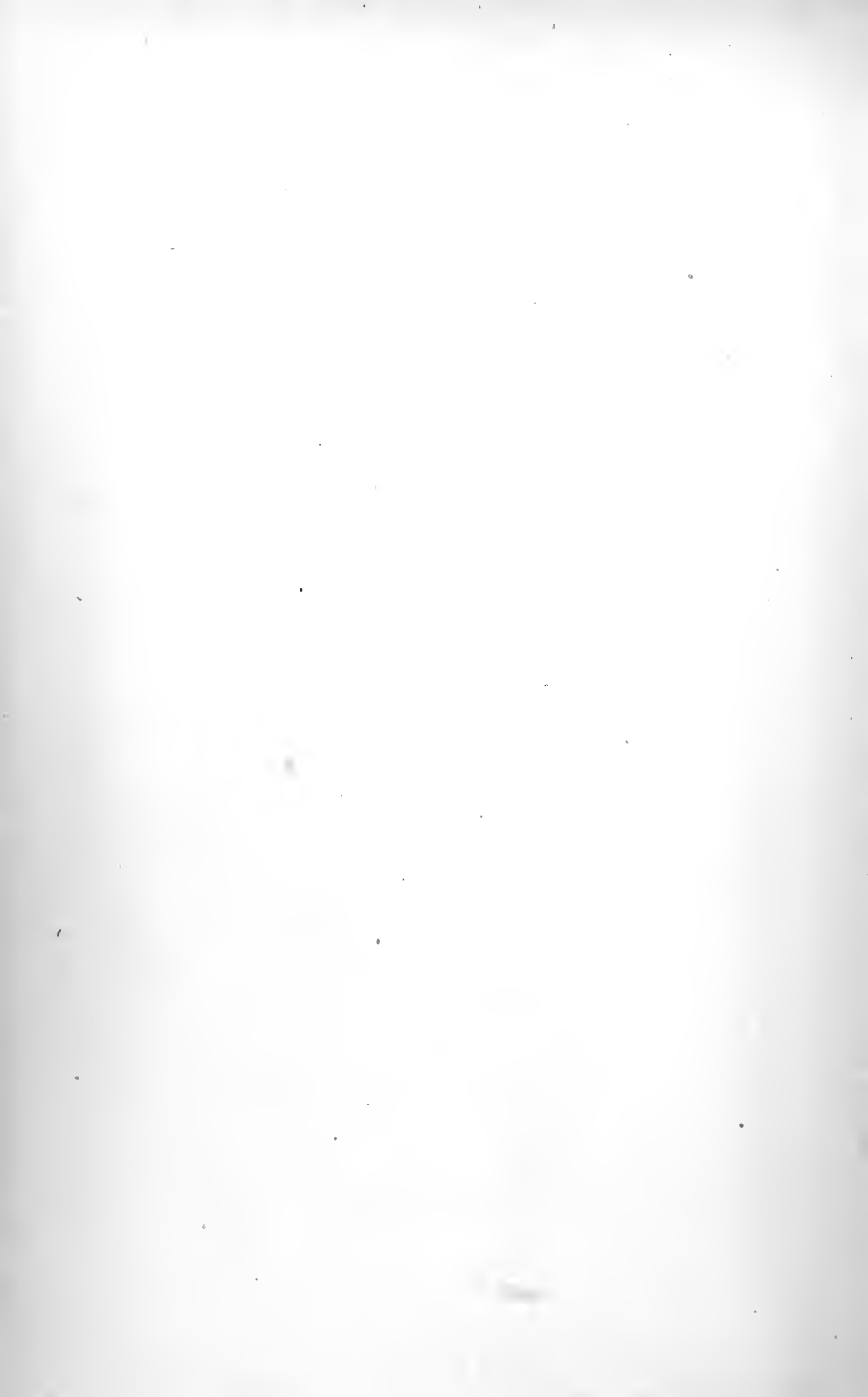
It would have been impossible for this service to have met these grave responsibilities had it not been for the wise provision by the Congress for the reserve corps, which made it practicable to secure the services of medical men who had entered the Army and Navy and were leaving those services after the war.

It is impracticable to retain the best of the men who are occupying important positions under the present uncertainties of reserve conditions. Appropriate legislation is recommended which will allow the admission of a limited number of competent persons into the regular corps under proper regulations similar to those recently enacted for the Medical Department of the Army.

Such legislation will involve no additional expense, and will insure the high class of personnel essential for the duties devolving upon the Public Health Service.

TRAVEL ALLOWANCES.

In view of the increase in cost of hotel accommodations and in the prices charged in restaurants and cafés, it is not possible for officers and employees traveling under official orders to obtain such accommodations at the price, \$5 per day, now fixed by law. It is, therefore, recommended that this amount be increased to \$8 per day. Without such increase the officers and employees who are traveling under official orders will suffer great hardship.



APPENDIX.

FINANCIAL STATEMENT.

Receipts and expenditures, Public Health Service, for the fiscal year ended June 30, 1920.

APPROPRIATIONS: "PUBLIC HEALTH SERVICE, 1920."

Subheads of appropriations.	Appropriations and repayments.	Expenditures.	Balance June 30, 1920.
Pay, etc., commissioned officers and pharmacists (appropriation \$895,000).....	\$895,412.60	\$881,316.40	\$14,096.20
Pay of acting assistant surgeons (appropriation \$300,000).....	300,451.08	278,056.21	22,394.87
Pay of other employees (appropriation \$744,000).....	744,260.33	706,554.26	37,706.07
Freight, transportation, etc. (appropriation \$48,000).....	48,113.07	47,643.97	469.10
Fuel, light, and water (appropriation \$125,000).....	125,031.42	124,832.04	199.38
Furniture, etc.....	8,000.00	7,646.68	353.32
Purveying depot supplies (appropriation \$85,000).....	88,684.17	82,000.00	6,684.17
Maintenance of Hygienic Laboratory.....	36,000.00	34,780.46	1,219.54
Maintenance of marine hospitals (appropriation \$625,000).....	633,528.56	619,838.31	13,690.25
Care of seamen, etc. (appropriation \$220,000).....	389,807.04	335,567.27	54,239.77
Books (appropriation \$500).....	501.90	490.79	11.11
Disbursements.....	-----	2,960,404.66	-----
Encumbrances.....	-----	158,821.73	-----
Total (appropriation \$3,086,500).....	3,269,790.17	3,118,726.39	151,063.78

APPROPRIATION: "QUARANTINE SERVICE, 1920."

Amount of appropriation.....	\$200,000.00
Repayments.....	66,265.33
Total.....	266,265.33
Expenditures:	
Disbursements.....	\$240,849.29
Encumbrances.....	16,629.23
	257,478.52
Balance, June 30, 1920.....	8,786.81

Expenditures by stations.

Name of station.	Pay and allowances, officers and employees. ¹	Maintenance.	Total maintenance, pay and allowances.
Alaska.....	\$200.00	-----	\$200.00
Biscayne Bay, Fla.....	1,451.50	\$325.50	1,777.00
Beaufort, S. C.....	749.70	155.64	905.34
Boco Grande, Fla.....	1,149.00	664.61	1,813.61
Boston, Mass.....	25,070.39	24,649.82	49,720.21
Brunswick, Ga.....	3,536.90	3,336.49	6,872.49
Cape Charles, Va.....	32,099.68	35,834.79	67,934.47
Cape Fear, N. C.....	6,593.69	3,359.77	9,952.76
Cedar Keys, Fla.....	250.00	-----	250.00
Charleston, S. C.....	11,345.01	6,758.25	18,103.26
Columbia River, Ore.....	9,605.16	4,393.68	13,998.84
Cumberland Sound, Fla.....	3,180.00	1,967.78	5,147.78
Darien, Ga.....	40.00	-----	40.00

¹ Paid from pay items appropriation "Public Health Service, 1920."

Expenditures by stations—Continued.

Name of station.	Pay and allowances, officers and employees.	Maintenance.	Total maintenance, pay and allowances.
Delaware Bay and River.....	\$975.00	\$1,529.43	\$2,504.43
Delaware Breakwater, Del.....	2,650.00	402.02	3,052.02
Eagle Pass, Tex.....	3,158.34	35.33	3,193.72
Eastport, Me.....	913.33		913.33
El Paso, Tex.....	6,466.47	233.25	6,699.72
Eureka, Calif.....	30.00	15.00	45.00
Galveston, Tex.....	22,891.64	14,309.39	37,201.03
Georgetown, S. C.....	345.00	10.60	355.60
Gulf, Miss.....	5,300.00	1,260.77	6,560.77
Hawaii.....	31,455.07	13,510.92	44,965.99
Key West, Fla.....	4,460.99	1,668.35	6,129.34
Marcus Hook, Pa.....	27,529.66	15,915.22	43,444.88
Miscellaneous.....		3,359.33	3,359.33
Mobile, Ala.....	11,955.17	8,164.73	20,119.90
New Orleans, La.....	23,625.20	11,033.79	34,658.99
Pascagoula, Miss.....	740.00	104.55	844.55
Pensacola, Fla.....	7,211.83	6,223.85	13,435.68
Perth Amboy, N. J.....	1,866.66	1,603.46	3,470.12
Portland, Me.....	4,214.17	2,829.44	7,043.61
Porto Rico.....	16,266.16	8,337.26	24,603.42
Port Angeles, Wash.....	325.00	24.00	349.00
Port Royal, S. C.....			
Port San Luis.....	505.00		505.00
Port Townsend, Wash.....	17,568.70	7,067.53	24,636.23
Providence, R. I.....	6,737.66	2,051.77	8,789.43
Reedy Island, Del.....	9,346.32	7,227.36	16,573.68
St. Andrews, Fla.....	300.00	65.50	365.50
St. George Sound, Fla.....	300.00	128.00	428.00
St. Johns River, Fla.....	2,355.00	645.16	3,000.16
St. Joseph, Fla.....	170.00	216.90	386.90
St. Thomas, Virgin Islands.....	6,633.33	1,537.87	8,221.20
San Diego, Calif.....	9,369.00	4,731.13	14,100.13
San Francisco, Calif.....	37,378.58	29,259.01	66,637.59
San Pedro, Calif.....	900.00	1,300.60	2,200.60
Savannah, Ga.....	11,191.29	7,880.85	19,072.14
Tampa Bay, Fla.....	6,806.888	4,551.59	11,358.47
Leprosy Hospital, Hawaii.....	7,835.17	1,593.21	9,428.38
Total.....	385,096.75	240,272.85	625,369.60

APPROPRIATION: "PREVENTING THE SPREAD OF EPIDEMIC DISEASES, 1920."

Amount of appropriation..... \$500,000.00
 Repayments..... 11,390.49

Total..... 511,390.49

Expenditures:

Disbursements..... \$500,708.73
 Encumbrances..... 6,681.76

As follows—

Plague eradication measures—

Louisiana..... 162,404.32
 California..... 47,018.34
 Washington..... 4,681.86

Prevention of trachoma—

Kentucky..... 48,728.47
 Tennessee..... 10,457.47
 North Dakota..... 7,771.59

Typhus fever prevention, Texas border—

84,850.04

Preventive measures—

Baltimore Quarantine..... 28,945.69
 Cuba, South America, Mexico..... 19,966.34
 France..... 12,104.25
 Italy, Spain..... 14,947.01
 Athens, Greece..... 1,000.00
 Buffalo, N. Y..... 4,825.43
 Detroit, Mich..... 4,765.45

Expenditures—Continued.

As follows—Continued.

Preventive measures—Continued.

Niagara Falls	\$6,261.18	
Ogdensburg, N. Y.	1,856.85	
Port Huron, Mich.	3,208.26	
Rosebank, Staten Island, N. Y.	2,305.35	
Sault St. Marie, Mich.	301.67	
Vaccine	8,422.28	
Travel, telegrams, stationery	32,541.64	
		\$507,390.40
Balance, June 30, 1920		4,000.00

NOTE.—Payments amounting to \$56,882.73 were made from pay items of appropriation "Public Health Service, 1920," account of epidemic duty.

APPROPRIATION: "FIELD INVESTIGATIONS OF PUBLIC HEALTH, 1920."

Amount of appropriation		\$300,000.00
Expenditures:		
Disbursements	\$279,089.24	
Encumbrances	2,492.76	
		281,582.00
Balance, June 30, 1920		18,418.00

NOTE.—Payments amounting to \$43,063.41 from pay items of appropriation, "Public Health Service, 1920," on account of field investigations.

APPROPRIATION: "NATIONAL QUARANTINE AND SANITATION."

Balance, June 30, 1920		\$810.63
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APPROPRIATION: "INTERSTATE QUARANTINE SERVICE, 1920."

Amount of appropriation		\$25,000.00
Expenditures:		
Disbursements	\$18,592.80	
Encumbrances	2,426.73	
		21,019.53
Balance, June 30, 1920		3,980.47

NOTE.—Payments amounting to \$15,207 from pay items of appropriation, "Public Health Service, 1920," on account of interstate quarantine.

APPROPRIATION: "SPECIAL STUDIES OF PELLAGRA, PUBLIC HEALTH SERVICE, 1920."

Amount of appropriation		\$30,000.00
Expenditures:		
Disbursements	\$28,118.39	
Encumbrances	892.00	
		29,010.39
Balance, June 30, 1920		989.61

NOTE.—Payments amounting to \$840 from pay items of appropriation, "Public Health Service, 1920," on account of studies of pellagra.

APPROPRIATION: "STUDIES OF RURAL SANITATION, PUBLIC HEALTH SERVICE, 1920."

Amount of appropriation		\$50,000.00
Expenditures:		
Disbursements	\$48,616.53	
Encumbrances	386.05	
		49,002.58
Balance, June 30, 1920		997.42

NOTE.—Payments amounting to \$12,785.81 were made from pay items of appropriation, "Public Health Service, 1920," account of studies of rural sanitation.

APPROPRIATION: "CONTROL OF BIOLOGIC PRODUCTS, PUBLIC HEALTH SERVICE, 1920."

Amount of appropriation-----	\$50,000.00
Expenditures:	
Disbursements-----	\$49,695.35
Encumbrances-----	134.62
	<hr/> 49,829.97
Balance, June 30, 1920-----	170.03

APPROPRIATION: "PROTECTING HEALTH OF MILITARY FORCES, PUBLIC HEALTH SERVICE, 1918 AND 1919."

Amount of balance, July 1, 1919-----	\$8,277.73
Expenditures-----	219.03
	<hr/>
Balance, June 30, 1920-----	8,058.70

APPROPRIATION: "SALARIES, OFFICE OF SURGEON GENERAL, PUBLIC HEALTH SERVICE, 1920."

Amount of appropriation-----	\$92,270.00
Expenditures-----	88,857.41
	<hr/>
Balance, June 30, 1920-----	3,412.59

APPROPRIATION: "NATIONAL HOME FOR LEPERS."

Balance, July 1, 1919-----	\$248,904.18
Expenditures-----	1,848.70
	<hr/>
Balance, June 30, 1920-----	247,055.48

APPROPRIATION: "PAY OF PERSONNEL AND MAINTENANCE OF HOSPITALS, PUBLIC HEALTH SERVICE, 1920."

Amount of appropriation-----	\$19,326,187.14
Repayments-----	129,273.59
	<hr/>
Total-----	19,455,460.73
Expenditures:	
Disbursements-----	\$18,756,134.43
Encumbrances-----	449,326.30
	<hr/>
	19,205,460.73
	<hr/>
Balance, June 30, 1920-----	250,000.00

NOTE.—Payments amounting to \$143,008.29 were made from pay items of appropriation "Public Health Service, 1920," on account of pay of personnel and maintenance of hospitals.

APPROPRIATION: "EXPENSE, DIVISION OF VENEREAL DISEASES, PUBLIC HEALTH SERVICE, 1920."

Amount of appropriation-----	\$200,000.00
Expenditures:	
Disbursements-----	\$183,109.16
Encumbrances-----	1,694.30
	<hr/>
	184,803.46
	<hr/>
Balance, June 30, 1920-----	15,196.54

NOTE.—Payments amounting to \$10,555.79 were made from pay items of appropriation, "Public Health Service, 1920," on account of expense Division of Venereal Diseases.

APPROPRIATION: "SUPPRESSING SPANISH INFLUENZA AND OTHER COMMUNICABLE DISEASES, 1919."

Balance, July 1, 1919-----	\$162,589.91
Expenditures-----	8,639.14
	<hr/>
Balance, June 30, 1920-----	153,950.77

APPROPRIATION: "HOSPITAL CONSTRUCTION, PUBLIC HEALTH SERVICE."

Balance, July 1, 1919, including subsequent deficiencies for fiscal year 1920	\$9,502,680.64
Expenditures	7,049,935.52
Balance, June 30, 1920	2,453,645.12

APPROPRIATION: "HOSPITAL FURNITURE, PUBLIC HEALTH SERVICE."

Amount of appropriation	\$210,000.00
Expenditures	18,972.75
Balance, June 30, 1920	191,027.25

APPROPRIATION: "INCREASE OF COMPENSATION, TREASURY DEPARTMENT, 1920."

Total payments, Public Health Service	\$1,556,904.55
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MISCELLANEOUS APPROPRIATIONS.

LEPROSY HOSPITAL, HAWAII.

Balance, June 30, 1920 (act Mar. 3, 1905)	\$16,956.35
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MARINE HOSPITALS.

Baltimore, Md. (act Mar. 28, 1918):

Balance, July 1, 1919	\$16,898.34
Expenditures	1,130.93

Balance, June 30, 1920	15,767.41
------------------------	-----------

Boston, Mass. (act Mar. 28, 1918):

Balance, July 1, 1919	19,915.26
Expenditures	

Balance, June 30, 1920	19,915.26
------------------------	-----------

New Orleans, La. (act Mar. 28, 1918):

Balance, July 1, 1919	14,678.66
Expenditures	9,145.35

Balance, June 30, 1920	5,533.31
------------------------	----------

New York, N. Y. (act Mar. 28, 1918):

Balance, July 1, 1919	37,768.59
Expenditures	18,566.95

Balance, June 30, 1920	19,201.64
------------------------	-----------

San Francisco, Calif. (act Mar. 28, 1918):

Balance, July 1, 1919	20,755.20
Expenditures	13,574.43

Balance, June 30, 1920	7,180.77
------------------------	----------

Savannah, Ga. (act Mar. 28, 1918):

Balance July 1, 1919	6,206.14
Expenditures	274.00

Balance, June 30, 1920	5,932.14
------------------------	----------

[Balances June 30, 1920.]

Cleveland, Ohio (act Mar. 4, 1909)	100.00
Cleveland, Ohio (act Mar. 4, 1907)	374.95
Cleveland, Ohio (act July 26, 1916)	1,000.00
Fort Stanton, N. Mex. (act Aug. 24, 1912)	3.20

QUARANTINE STATIONS.

Boston, Mass. (act Oct. 6, 1917) :

Balance, July 1, 1919	\$19,587.79
Expenditures	7,673.19

Balance, June 30, 1920

\$11,914.60

Cape Charles (act Nov., 1918)	100,000.00
Expenditures	24,036.02

Balance, June 30, 1920

75,963.98

Gulf (act June 12, 1917)	8,000.00
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Key West (act June 12, 1917)	7,000.00
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Reedy Island (act Nov. 4, 1918) :

Balance July 1, 1919	36,576.75
Expenditures	3,575.11

Balance, June 30, 1920

33,001.64

Savannah, Ga. (act Nov. 4, 1918)	26,000.00
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[Balances June 30, 1920.]

Brunswick (act June 25, 1910)	1,708.87
Charleston (act Mar. 4, 1909)	634.46
Columbia River (act June 25, 1910)	745.47
Columbia River (act June 12, 1917)	25,000.00
Columbia River (act July 1, 1916)	4,201.19
Delaware Breakwater (act Mar. 4, 1907)	857.00
Gulf (act Mar. 4, 1907)	353.35
Honolulu (act Sept. 8, 1916)	10,000.00
Honolulu (act Mar. 4, 1907)	390.52
Mobile (act July 1, 1916)	10,000.00
New Orleans (act July 1, 1916)	25,000.00
Pensacola (act Mar. 4, 1917)	18.02
Reedy Island (act Mar. 4, 1909)	66.71
San Francisco (act Mar. 27, 1908)	180.75
San Francisco (act June 30, 1906)	1,511.71
Savannah (act Mar. 4, 1909)	410.85

UNDER SUPERVISING ARCHITECT.

MARINE HOSPITALS.

Boston, Mass. (act June 5, 1920)	\$54,300.00
Chicago, Ill. (act July 19, 1919)	121,000.00
Cincinnati, Ohio (act July 19, 1919)	40,000.00
Dawson Springs, Ky. (act Mar. 3, 1919)	1,500,000.00
Mobile, Ala. (act July 19, 1919)	60,000.00
Stapleton, N. Y., Staten Island (act Mar. 3, 1919)	190,000.00
Norfolk, Va. (act Mar. 3, 1919)	900,000.00
Philadelphia, Pa. (act July 19, 1919)	20,000.00
Savannah, Ga. (act July 19, 1919)	10,000.00
Savannah, Ga. (act June 5, 1920)	34,000.00

QUARANTINE STATIONS.

Cape Charles, Va., Craney Island (act July 19, 1919)	20,000.00
Cape Charles, Va., Craney Island (act Nov. 4, 1919)	125,000.00
Cape Fear, N. C., South Port (act June 5, 1920)	15,000.00
New York, N. Y. (act June 5, 1920)	1,395,275.00
Port Townsend, Wash. (act June 5, 1920)	14,000.00
Reedy Island, Delaware River, Del. (act Nov. 4, 1918)	40,000.00
Texas (act of June 5, 1920)	90,071.00

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